

Translating Data into Images

Dario Rodighiero

École polytechnique fédérale de Lausanne (EPFL)

Massachusetts Institute of Technology (MIT)

Séminaire d'écriture numérique et éditorialisation

Thursday, January 17th 2019

Transforming, Projecting, Translating

transform (transformer)

verb [*with object*]

1 make a marked change in the form, nature, or appearance of: *lasers have transformed cardiac surgery | he wanted to **transform** himself **into** a successful businessman.*

2 *Mathematics* change (a mathematical entity) by transformation.

project (projeter)

verb | prə'jekt | [*with object*]

1 estimate or forecast (something) on the basis of present trends: *spending was **projected** at \$72 million.*

2 [*no object*] extend outward beyond something else; protrude: *I noticed a slip of paper **projecting from** the book* | (as adjective **projecting**) : *a projecting bay window.*

3 throw or cause to move forward or outward: *seeds are projected from the tree.*

4 present or promote (a particular view or image): *he strives to project an image of youth.*

5 *Geometry* draw straight lines from a center of or parallel lines through every point of (a given figure) to produce a corresponding figure on a surface or a line by intersecting the surface.

6 make a projection of (the earth, sky, etc.) on a plane surface.

translate (traduire)

verb *[with object]*

1 express the sense of (words or text) in another language: *several of his books were **translated into** English.*

2 move from one place or condition to another: *she had been translated from familiar surroundings to a foreign court.*

3 *Physics* cause (a body) to move so that all its parts travel in the same direction, without rotation or change of shape.

Callon, Michel. 1984. "Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St. Brieuc Bay." *The Sociological Review* 32 (1): 196–233. doi:10.1111/j.1467-954x.1984.tb00113.x.

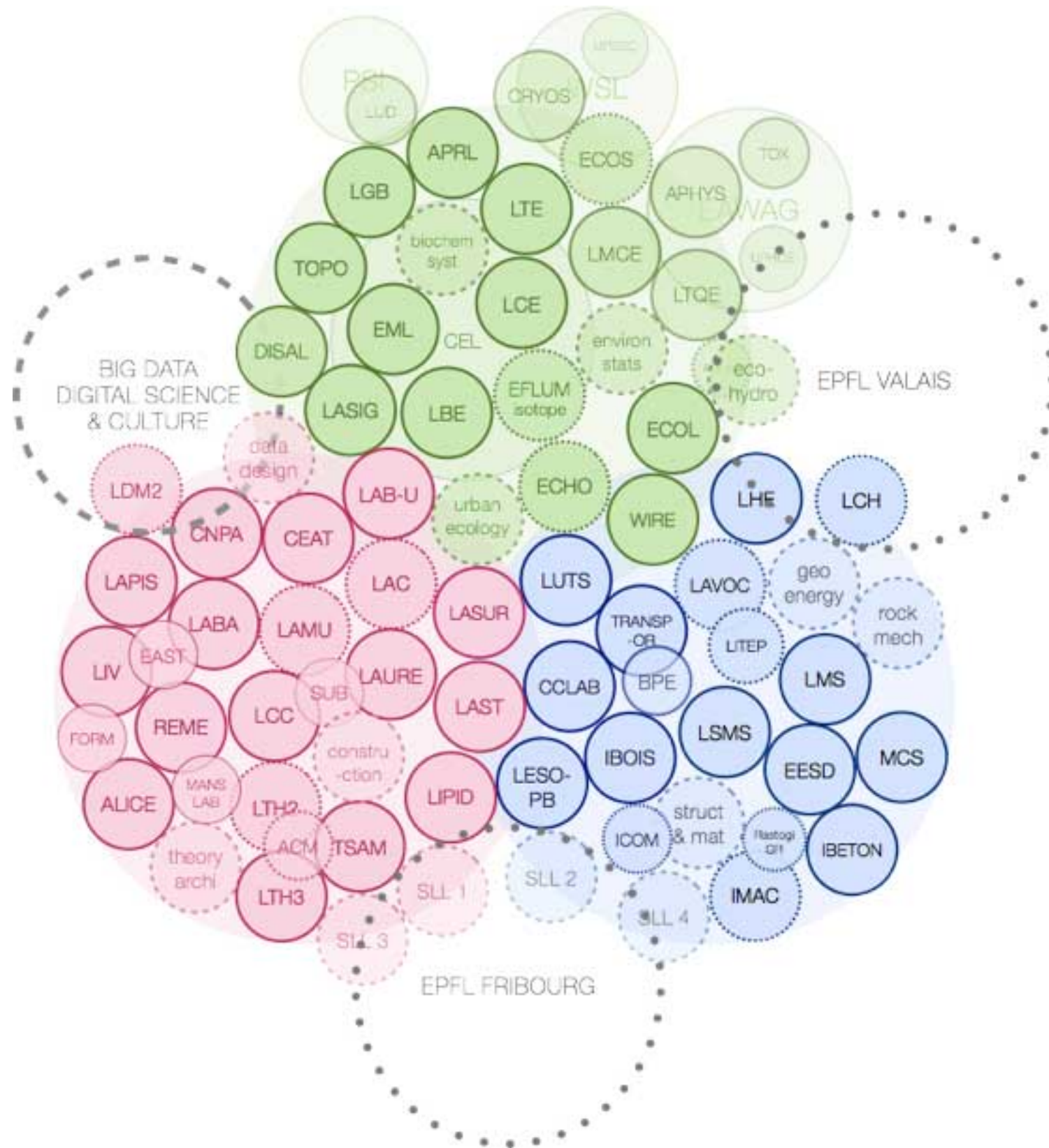
Affinity Map

the case study

The Affinity Map is a visual representation of **ENAC**

ENAC is the school of building constructions that gathers
Architecture, Civil and Environmental Engineering

The ENAC is composed by **three institutes,**
seventy laboratories and a **thousand of scholars**



Personal view of Marilyne Andersen of ENAC

Representing Academic Practice

the exercise, the thesis

Academic Practice

Many activities

Different according to discipline

Not only literature

Collaboration

A component of academic practice

Multidimensional (writing, teaching, etc.)

Multi-scale (scholars, laboratories, etc.)

Affinity

A way to describe the academic practice

Intellectual and operational closeness between individuals

Actual and potential

Visualization

Academic practice is mostly hidden

It can be made visible

It can be made visible using affinities

Questions about Representing Academic Practice

Which data describes the academic practice?

How to translate these data?

Is there an ethics of scholar representation?

Data Investigation

embrace all of the different practices

manque description ??

Indicators	Primary source	Secondary source	To be specially required in online labs' activity report?
Focus topics (thematics)	Symphony database	Lab's websites (research)	Maybe (would be nice to have the user confirming existing data from Symphony/lab's website for instance)
Keywords	Lab's websites (metadata "keywords", from audit 2011)	Lab's websites (research)	Idem <i>pas possible</i>
Expertise areas	Symphony database	Lab's websites (expertise box)	Idem
Publications keywords and contents/abstract	Infoscience		No
Publications co-authors and their institutions	Infoscience (but institutions may be labelled variously...)	People's publication page	No
Alumni a3 (activity sector, localization)	Alumni database (with probable confidentiality issues?)		No
Co-teaching	IS-Academia	People's teaching page	Maybe (it could be provided by selecting the joint Professor from a list in the online formular?)
Industrial partners	Audit 2011 or lab's annual reports (extract from "valorization, collaboration & network")	Lab's annual reports	Yes (should be structured in an easy way for being extracted)
Main funding organizations	EPFL Grants database (maybe not possible?)		Yes (proposing a selectable list?) <i>pas possible</i>
Link to flagship projects	Audit 2011 or lab's annual reports		Yes (proposing a selectable list, if possible?)
People & Team	<i>Annuaire synthétique</i> People's pages (Expertise+Biography&Work +Teaching)		No
Lab's activities (events co-organised, guest speaker invitation, ...)	Memento	News flux	Maybe

faire une liste glissant
laisser les gens proposer eux-mêmes
ce qu'ils considèrent comme flagship

2 choses différentes

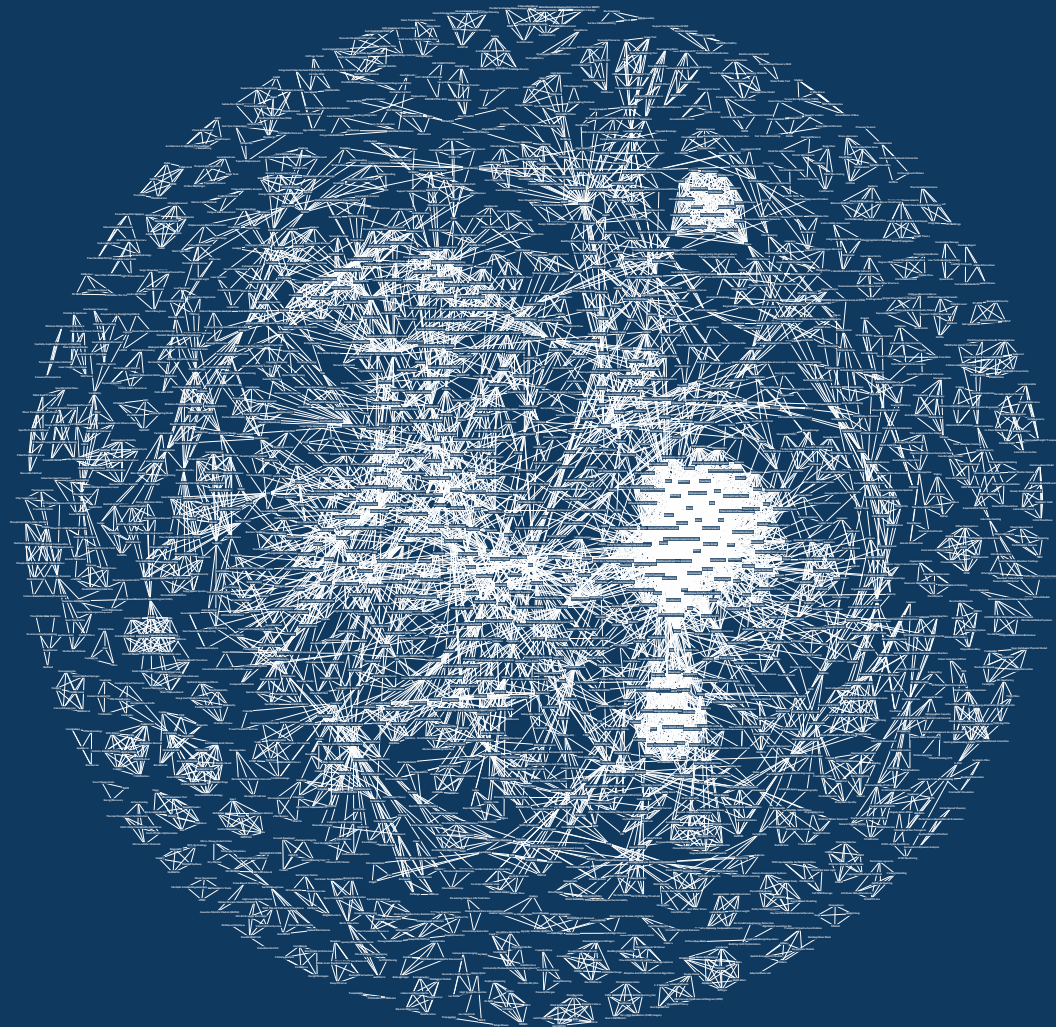
comment
gérer les mouvements?

il n'a pas de sens
du moment qu'il y
a accès aux flux!



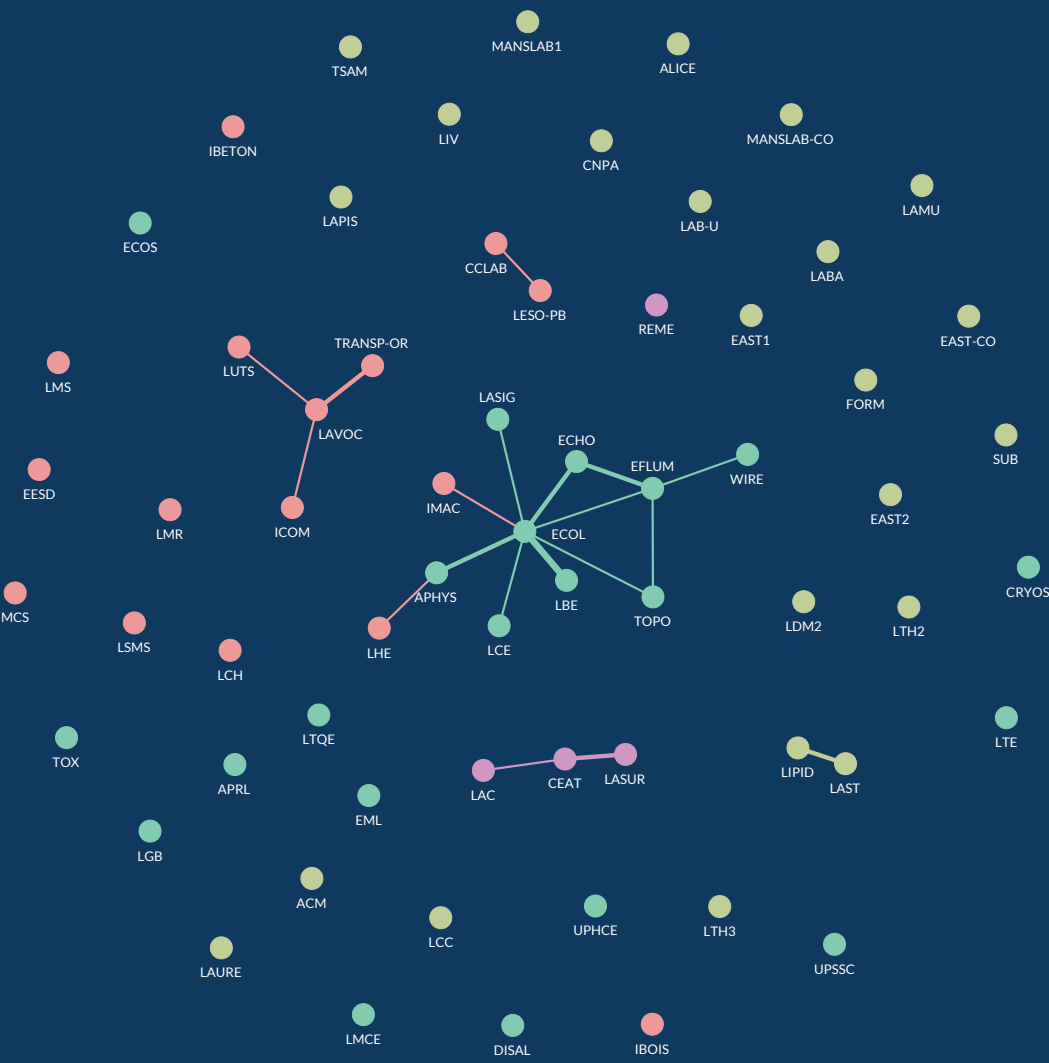
[illegible]

MOTS CLÉS PARTAGÉS ENTRE LES PUBLICATIONS

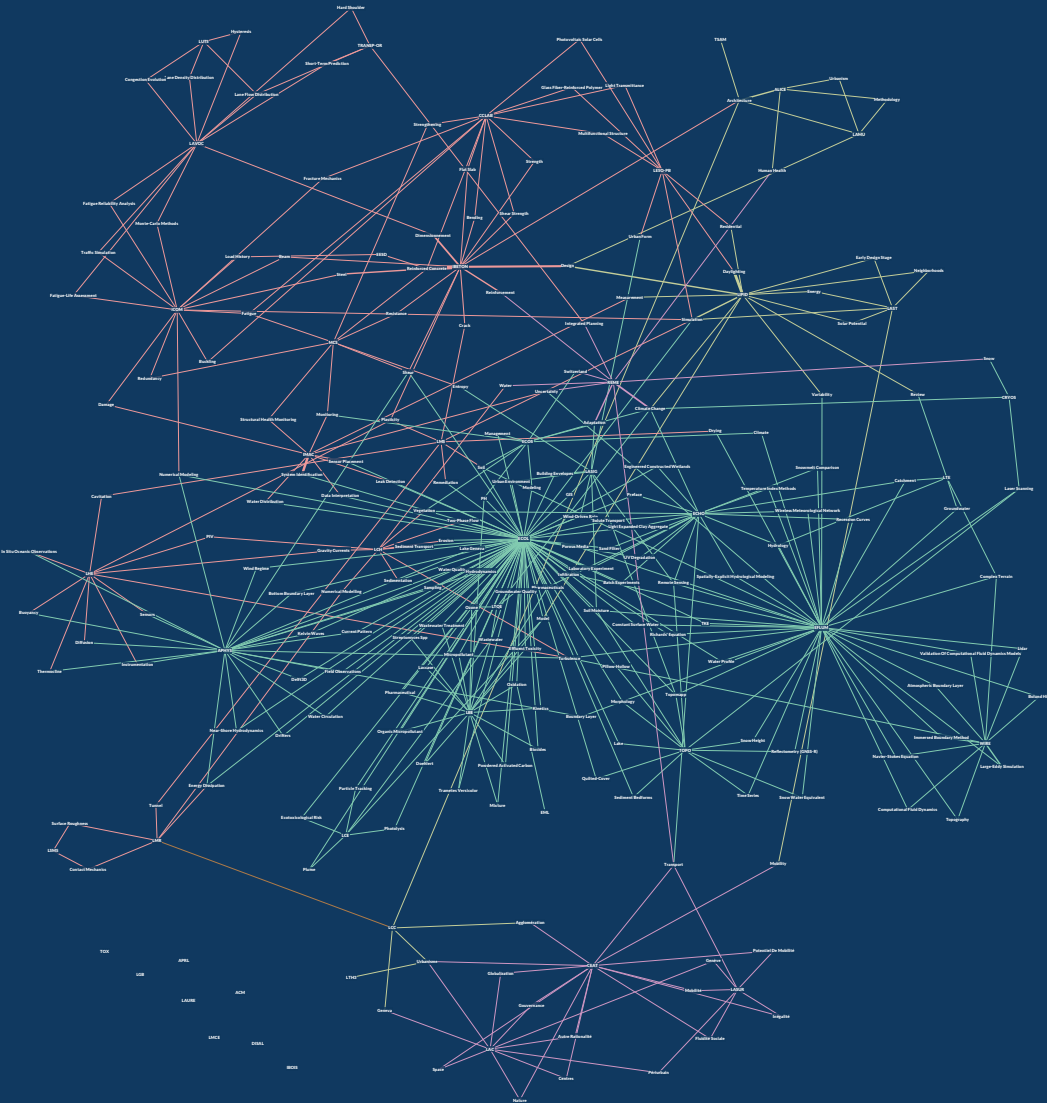


ENSEIGNEMENTS DE L'ENAC QUI PARTAGENT DES COLLABORATEURS

LABORATOIRES AVEC LES PUBLICATIONS PARTAGÉES



RÉSEAU DE LABORATOIRES AVEC DES MOTS CLÉS EN COMMUN



Information	Affinity type	Source
Lab thematics	Potential	Symphony
Lab thematics	Potential	EPFL website
Individual expertise	Potential	Symphony
Individual expertise	Potential	EPFL website
Keywords	Potential	Audit 2011
Keywords	Potential	InfoScience
Co-authoring	Actual	InfoScience
Co-teaching	Actual	IS-Academia
Co-advising	Actual	IS-Academia
Grants	Actual	Grant database
Industrial partners	Actual	Audit 2011

Table of digital traces, the strikethrough identifies not usable data.

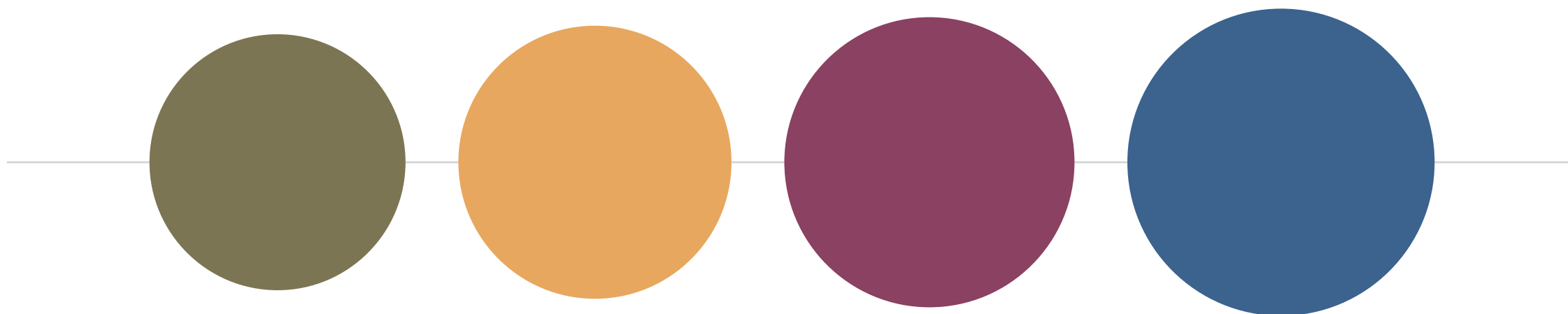
The *structure of the school* was used to reassemble laboratories and institutes. In particular, the **personal ID** (SCIPER), the **affiliations** of the staff and the **hierarchical structure** of the EPFL.

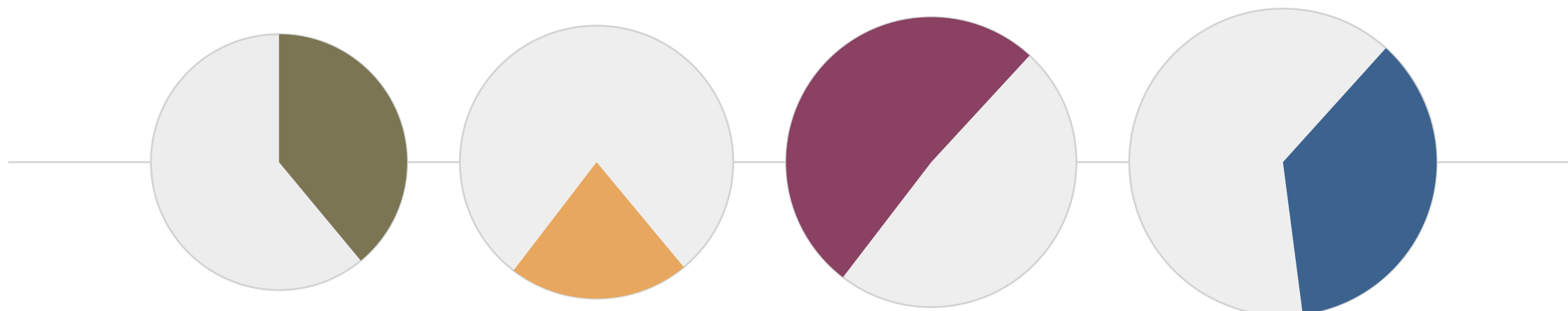
We identifies three types of *actual affinities*: the **publications** stored in the *Infoscience system*, the **courses** and the **supervision** recorded in *IS-Academia*.

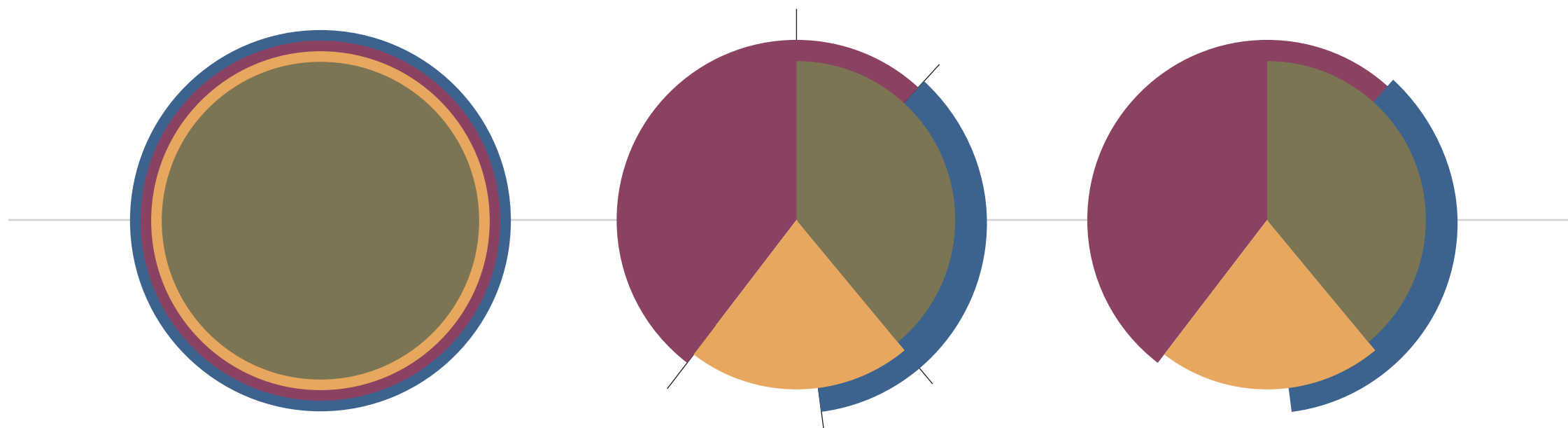
Potential affinities were generated as **keywords** through an algorithm of text mining working on the publication abstracts of the ENAC laboratories.

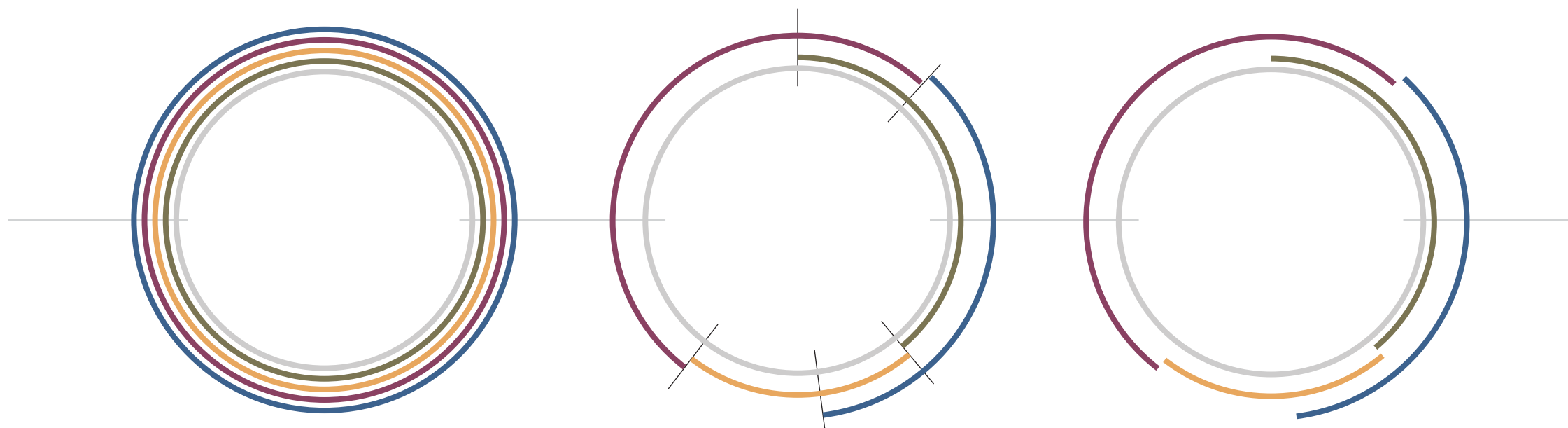
Visual Investigation

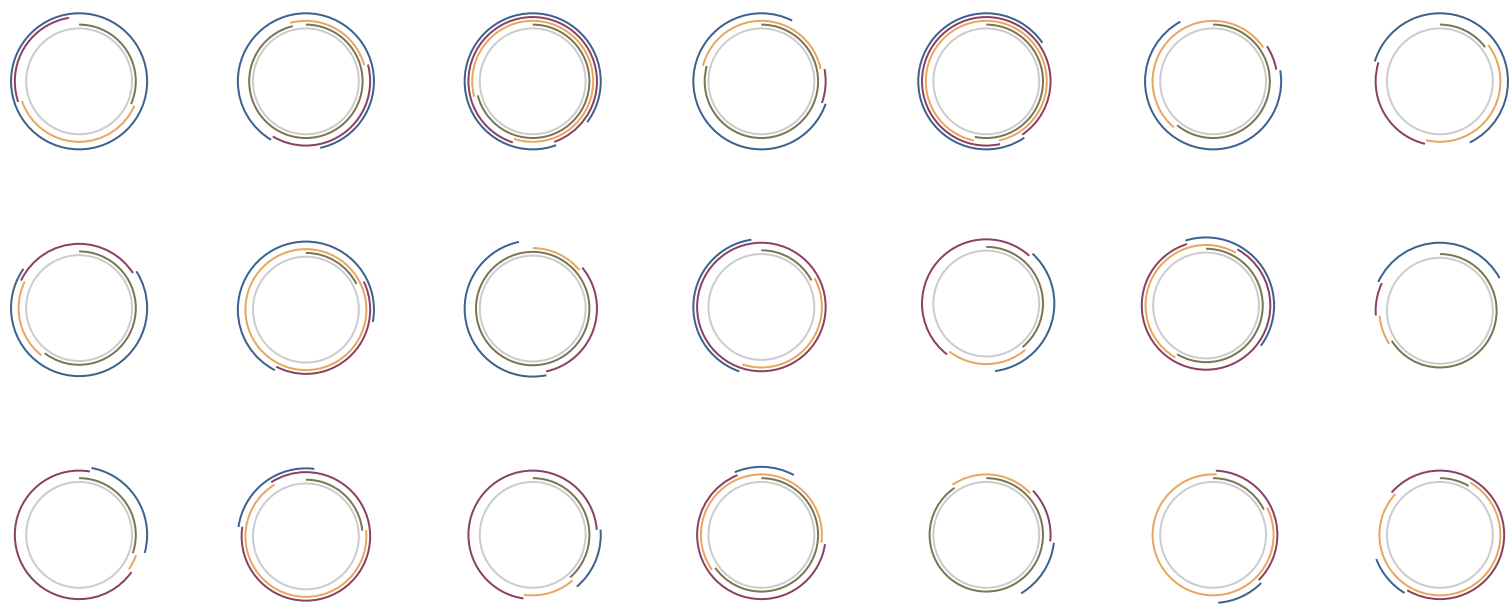
drawing laboratories

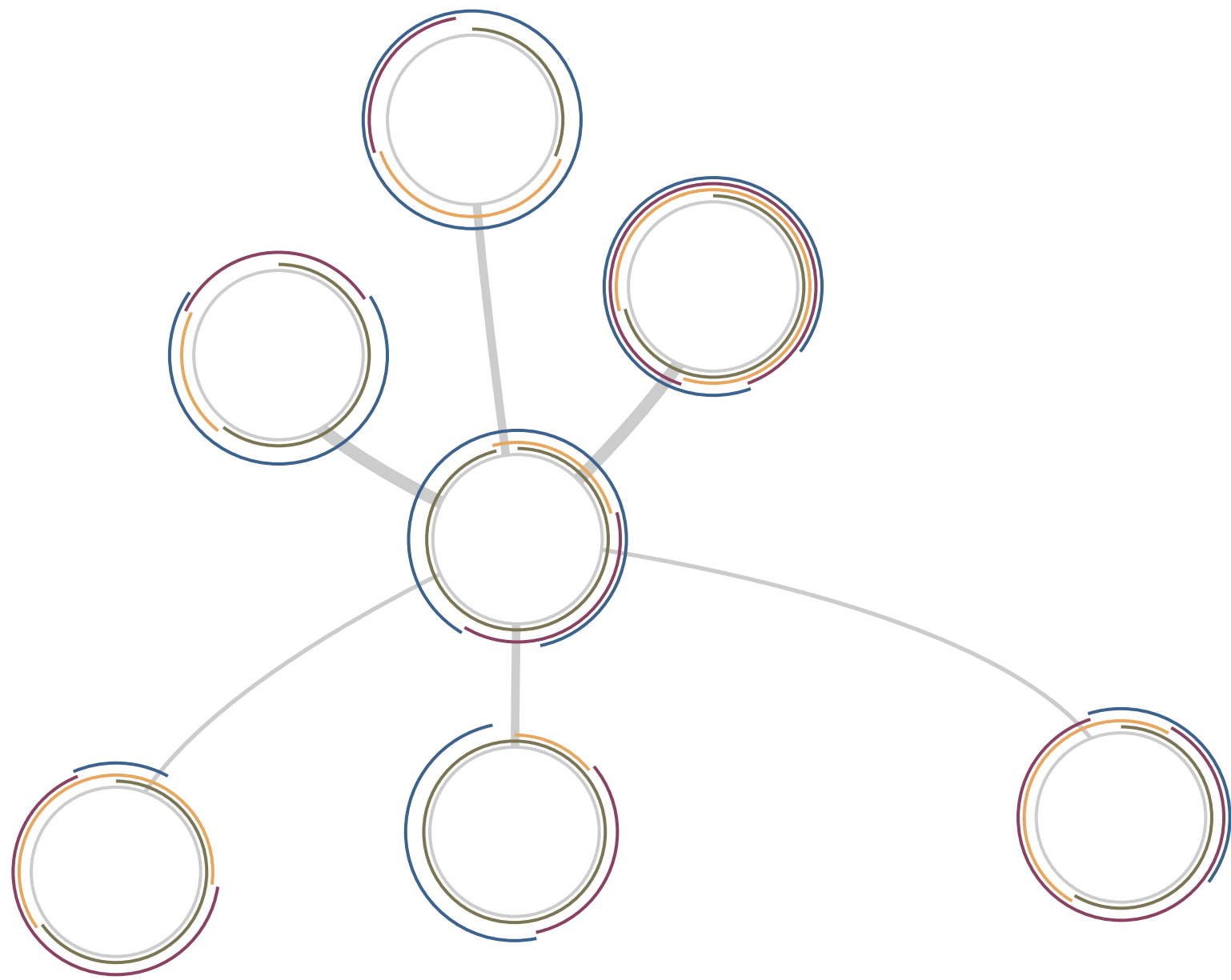


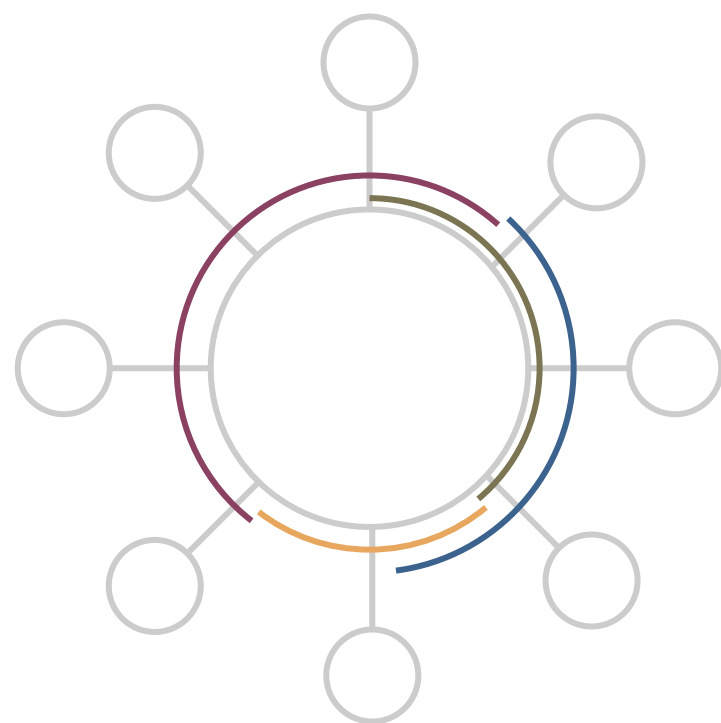


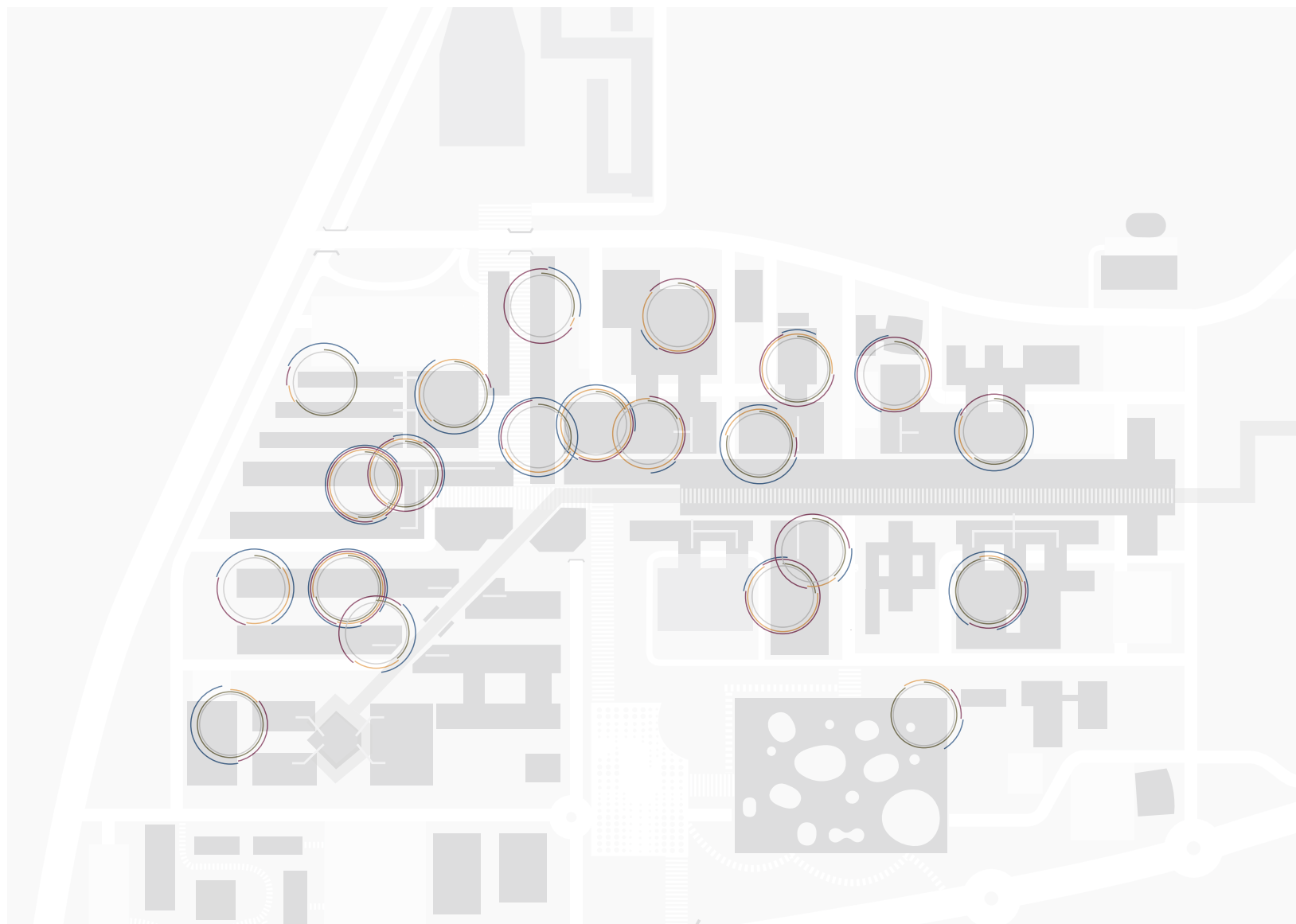


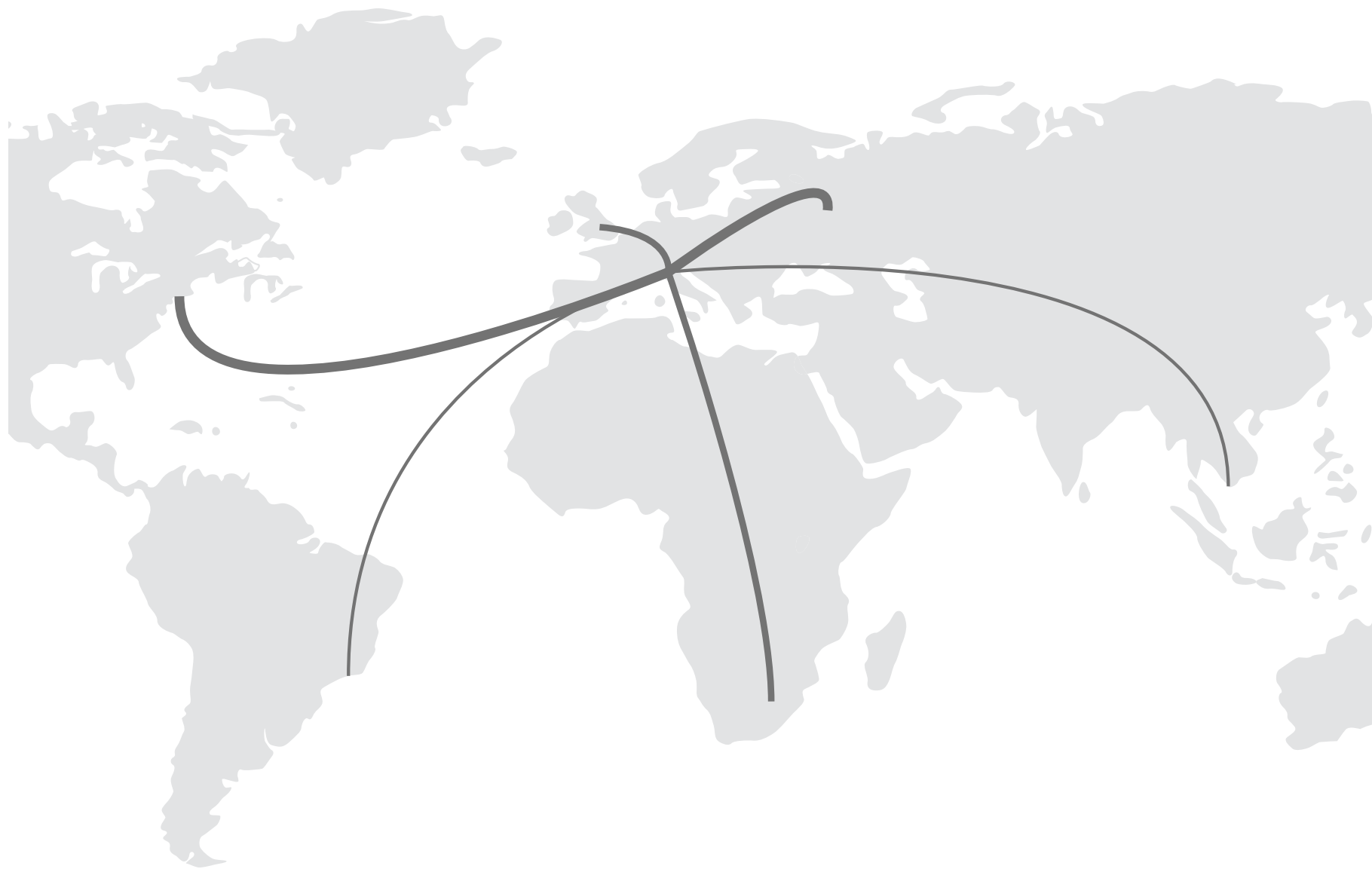






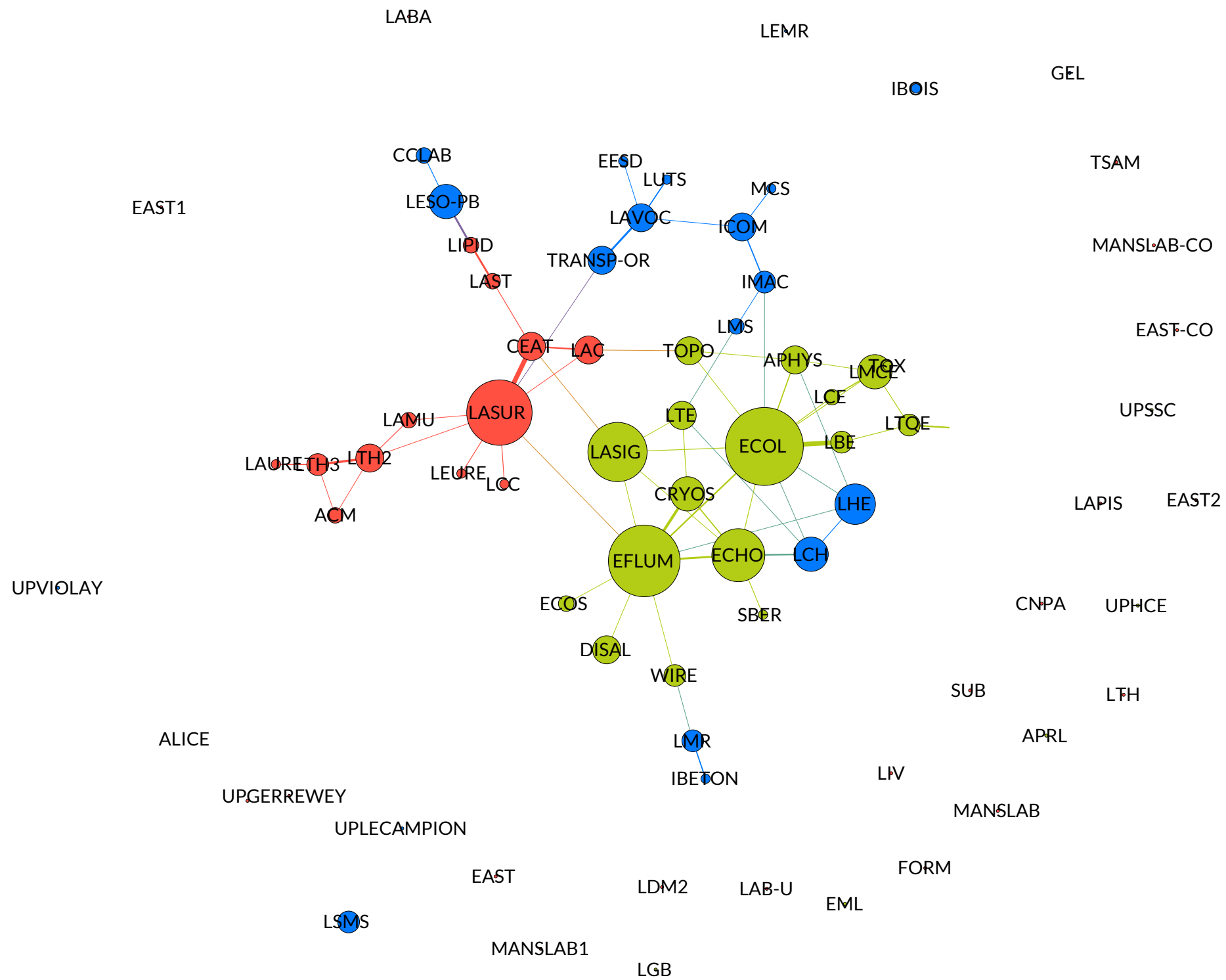




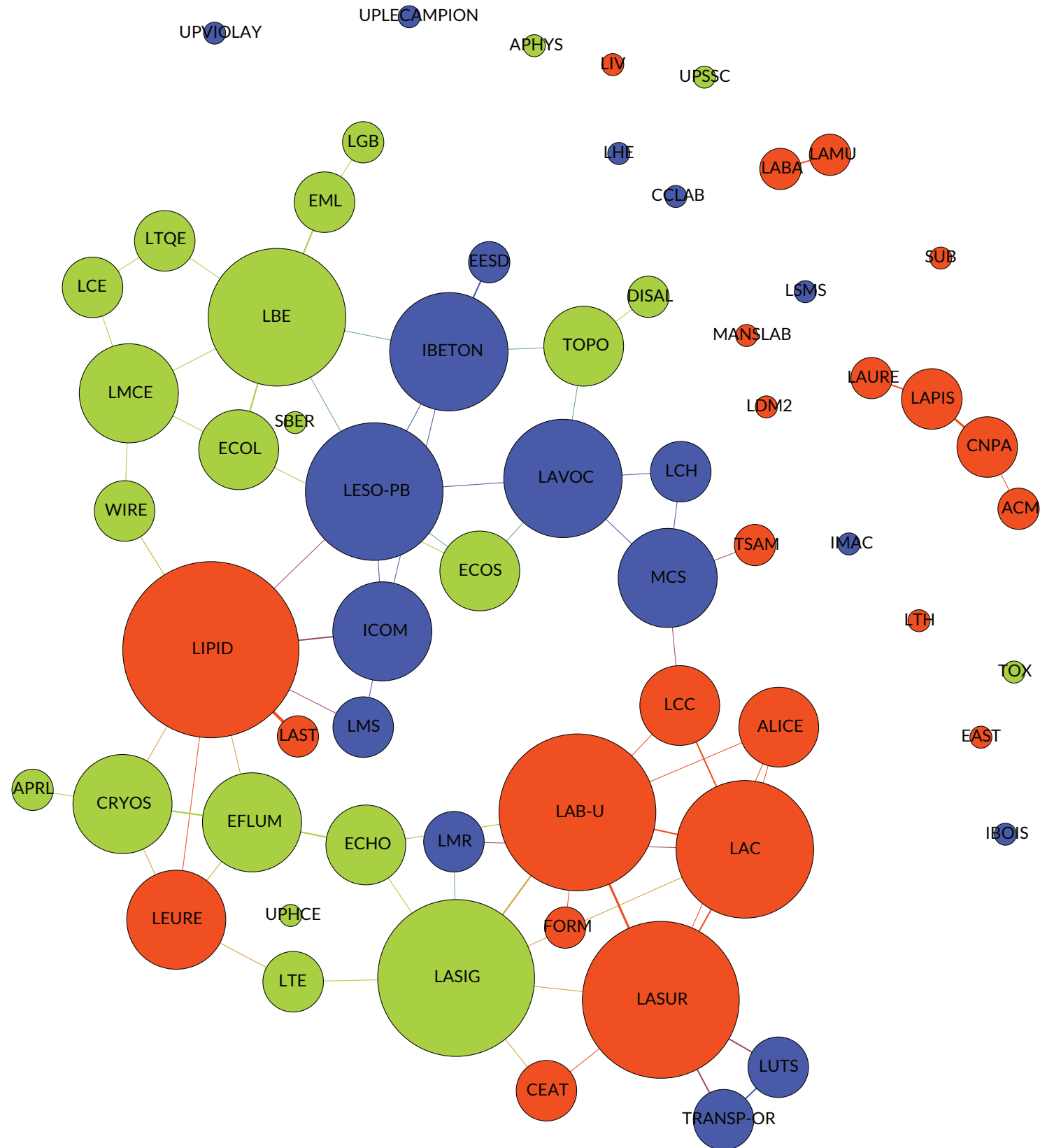


Hexagonal Network Visualization

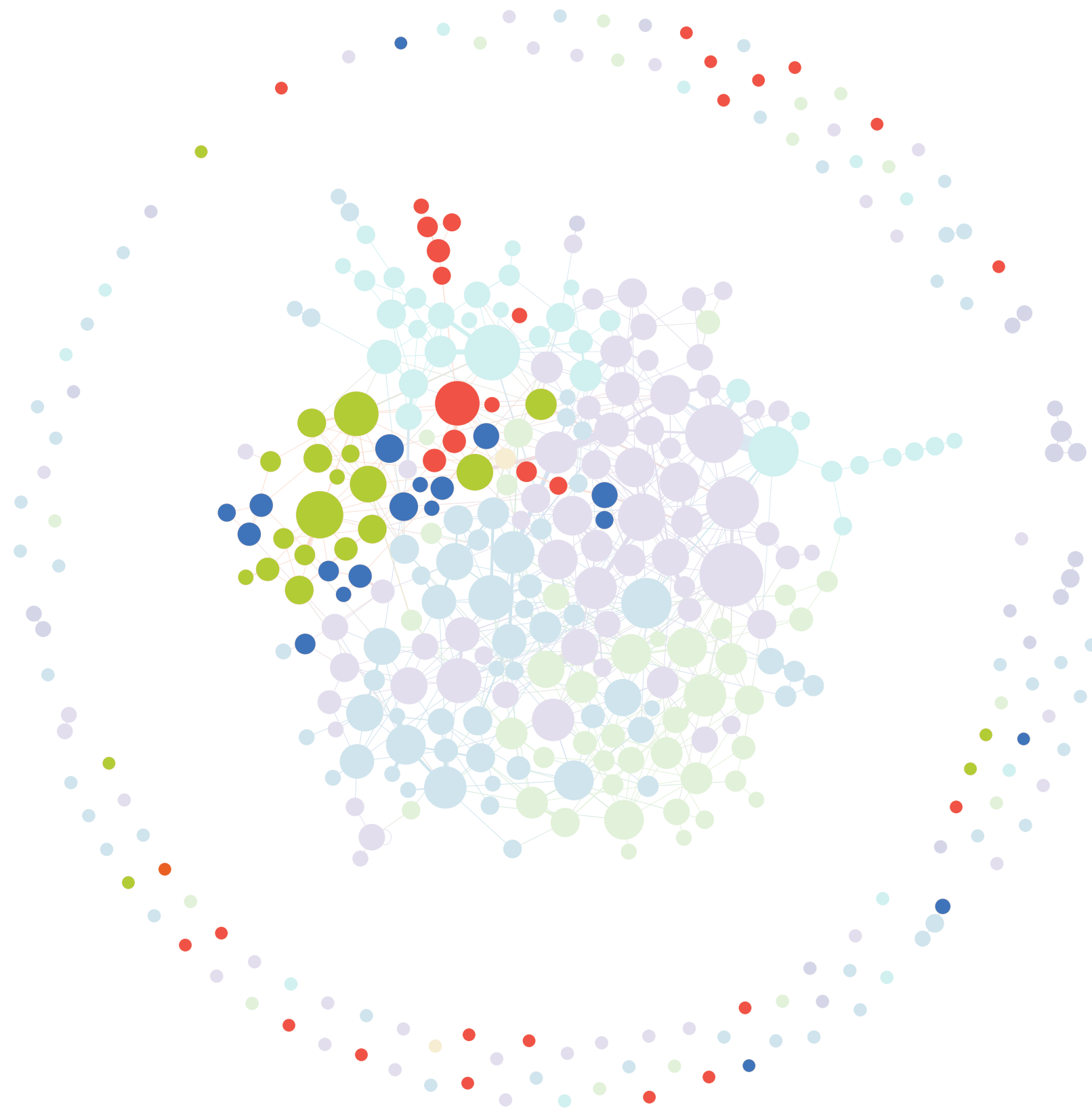
size, isolemment, continuity



Publications



Education (Supervision and Courses)



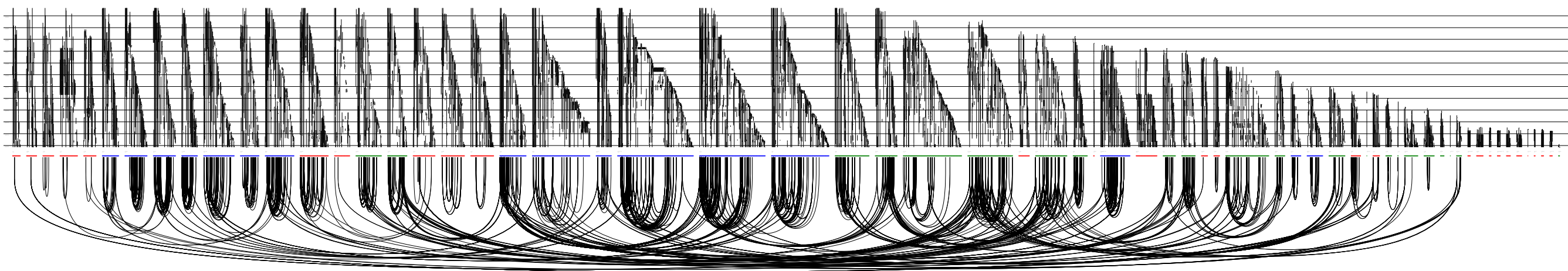
Publications

*“Design is the conscious and intuitive effort to impose **meaningful order**. [...] Our delight in the order we find in frost flowers on a window pane, in the hexagonal perfection of a honeycomb, in leaves, or in the architecture of a rose, reflects man’s preoccupation with pattern.”*

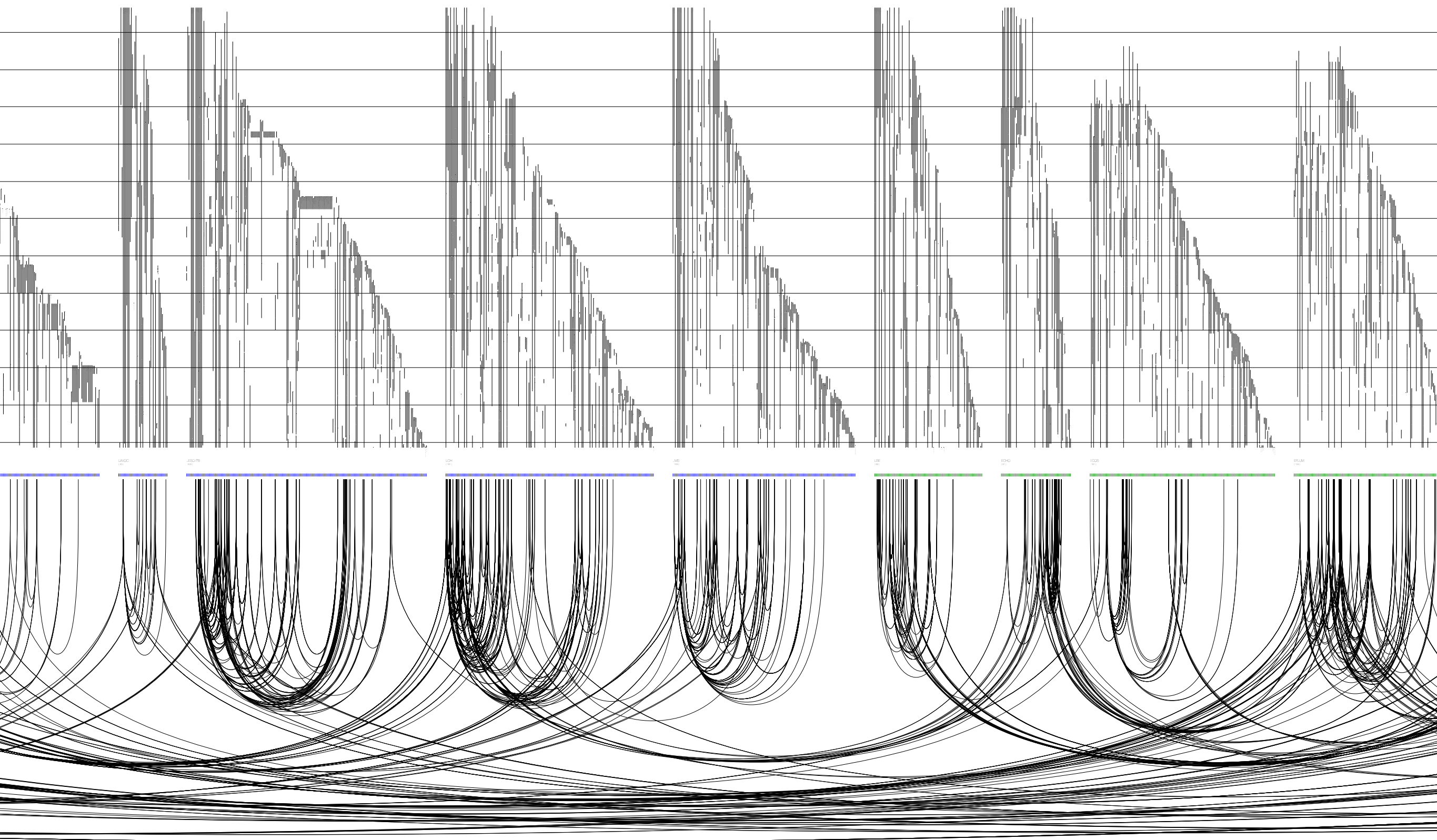
*“Regular graphs are unique in that each node has exactly the same number of links. Indeed, in a two-dimensional mesh of perpendicular lines forming a simple square lattice each node has exactly four links, or in a **hexagonal lattice of a beehive** each node is connected to exactly three others [links].”*

Back to Individual

the whole is different than the sum of its parts

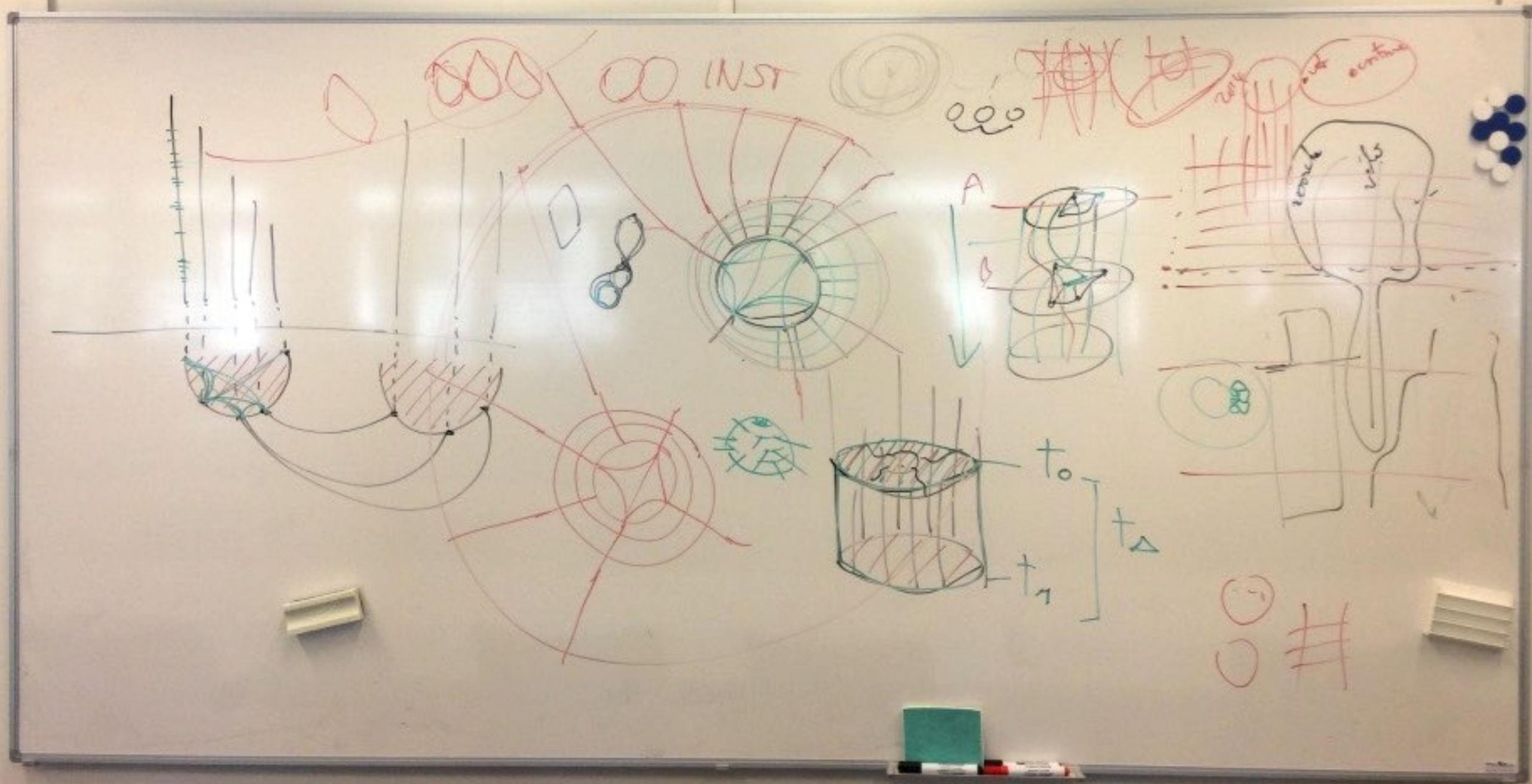


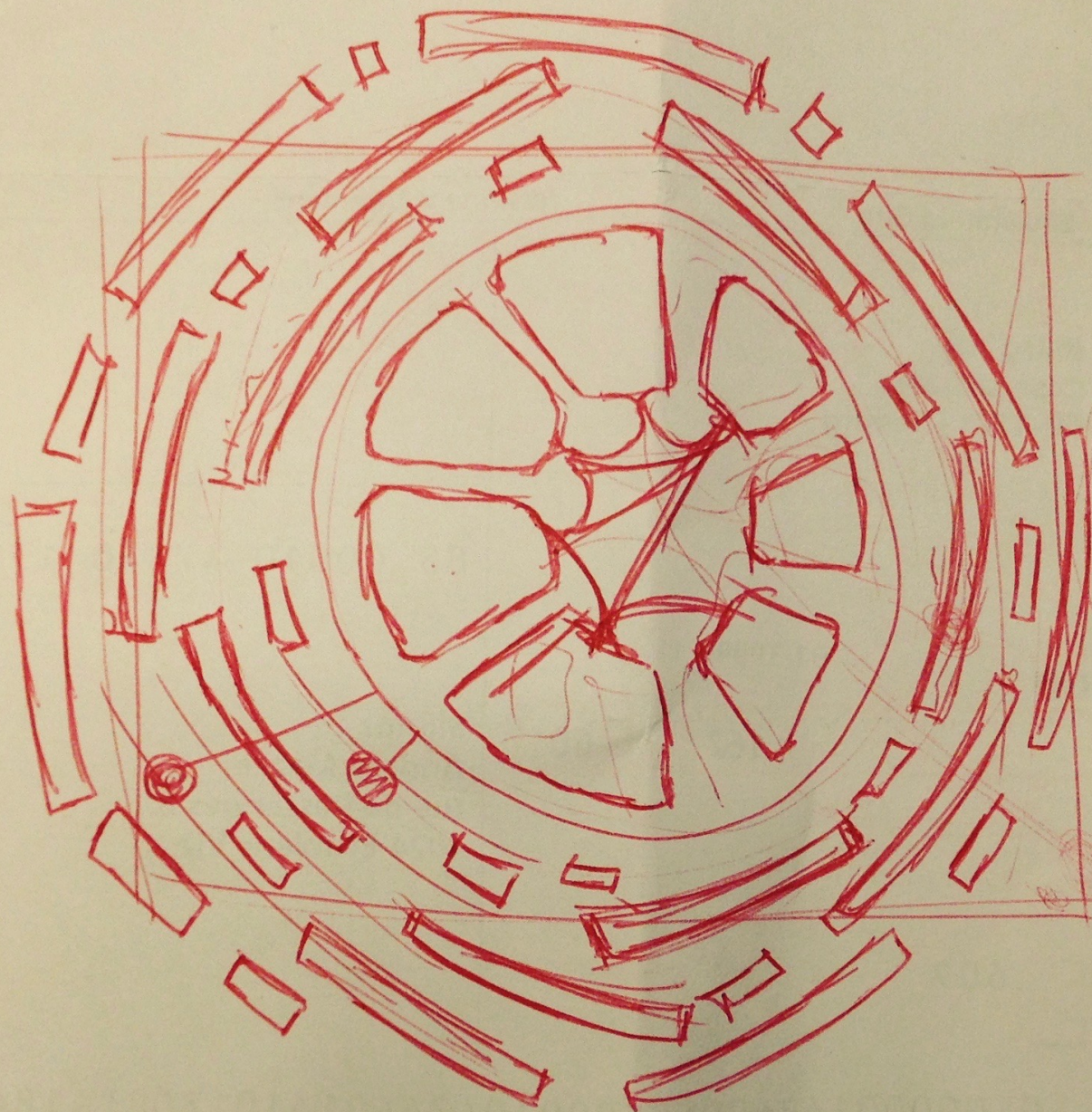
Making individuals and affinities visible together.



Making individuals and affinities visible together.







Dorm & Grick (1994)

ONTOLOGIA

CONTENT

MEANING

INT. COMP. → EXT. COMP.

EL. PROGR.

CONT.

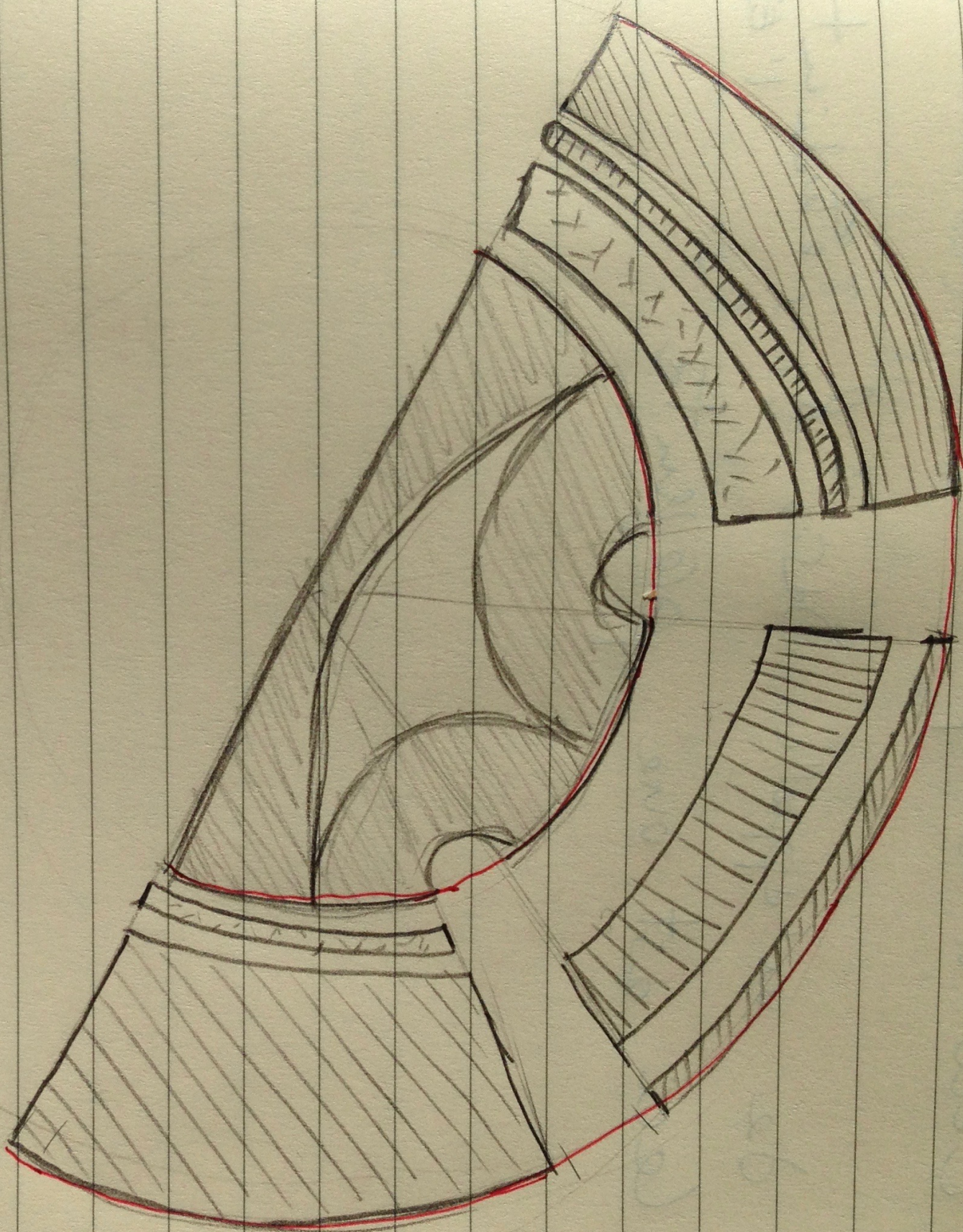
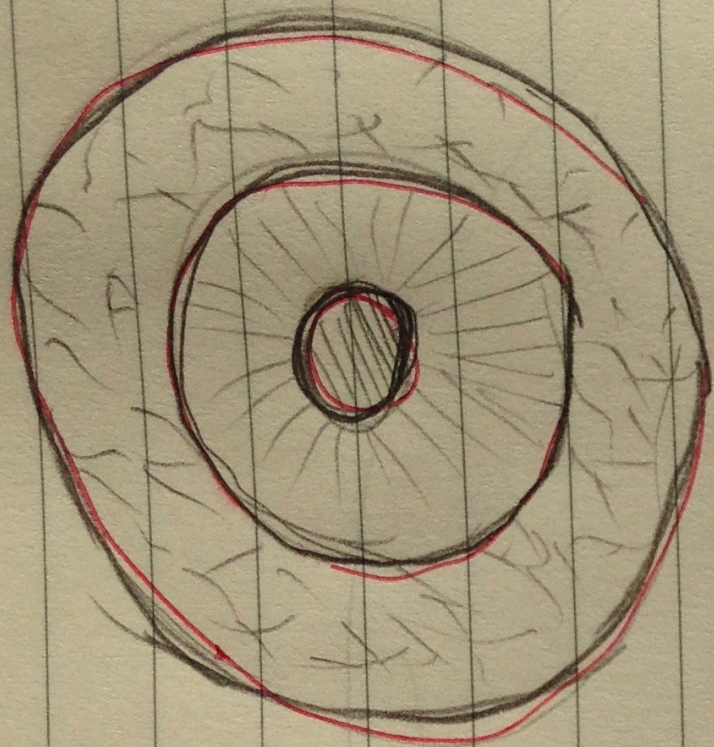
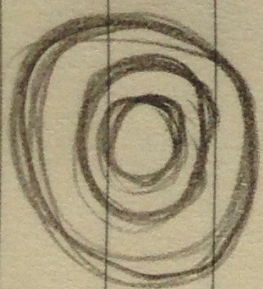
MAP.

PROCESS

TIME

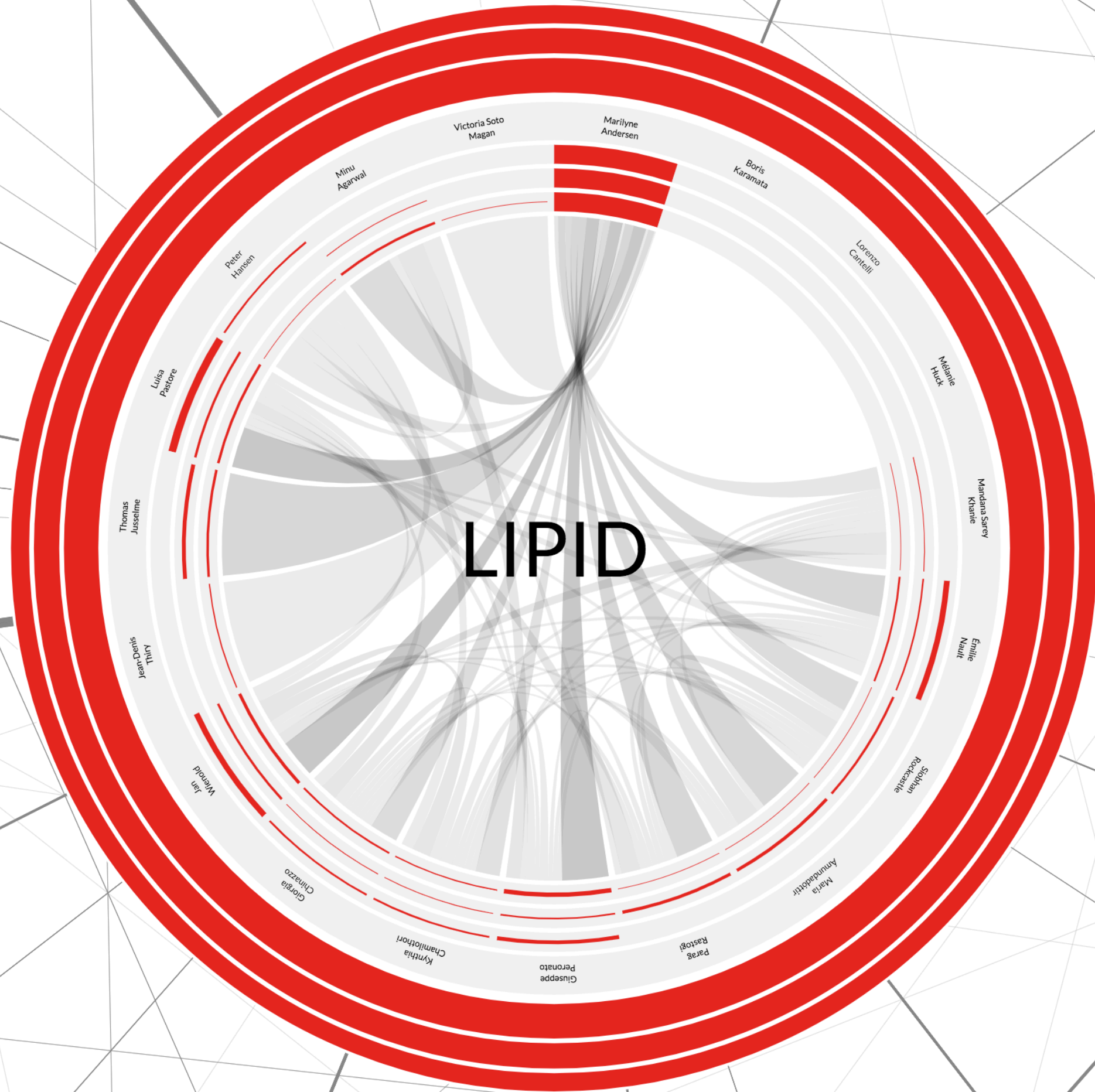
75

RISORSE





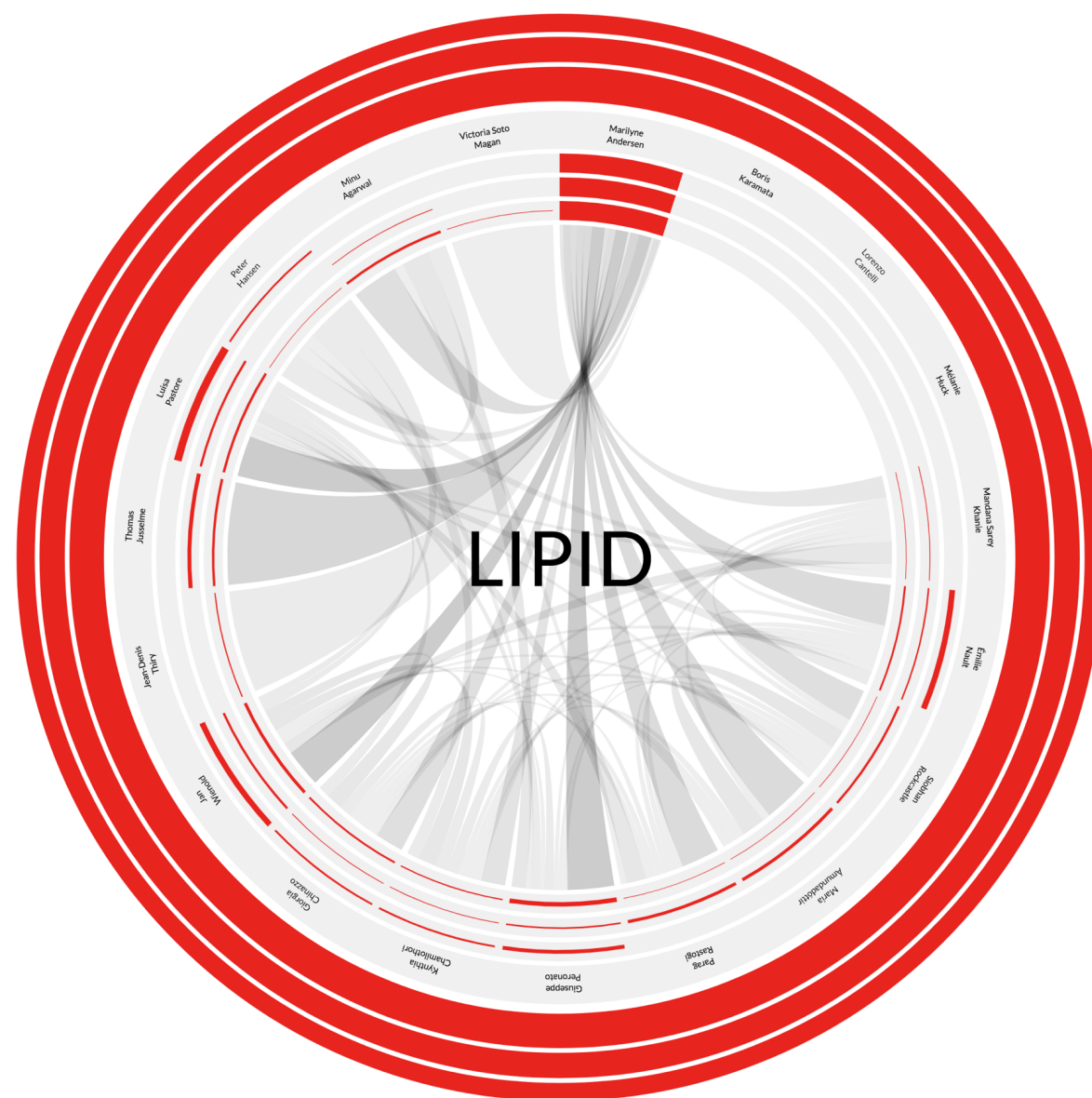
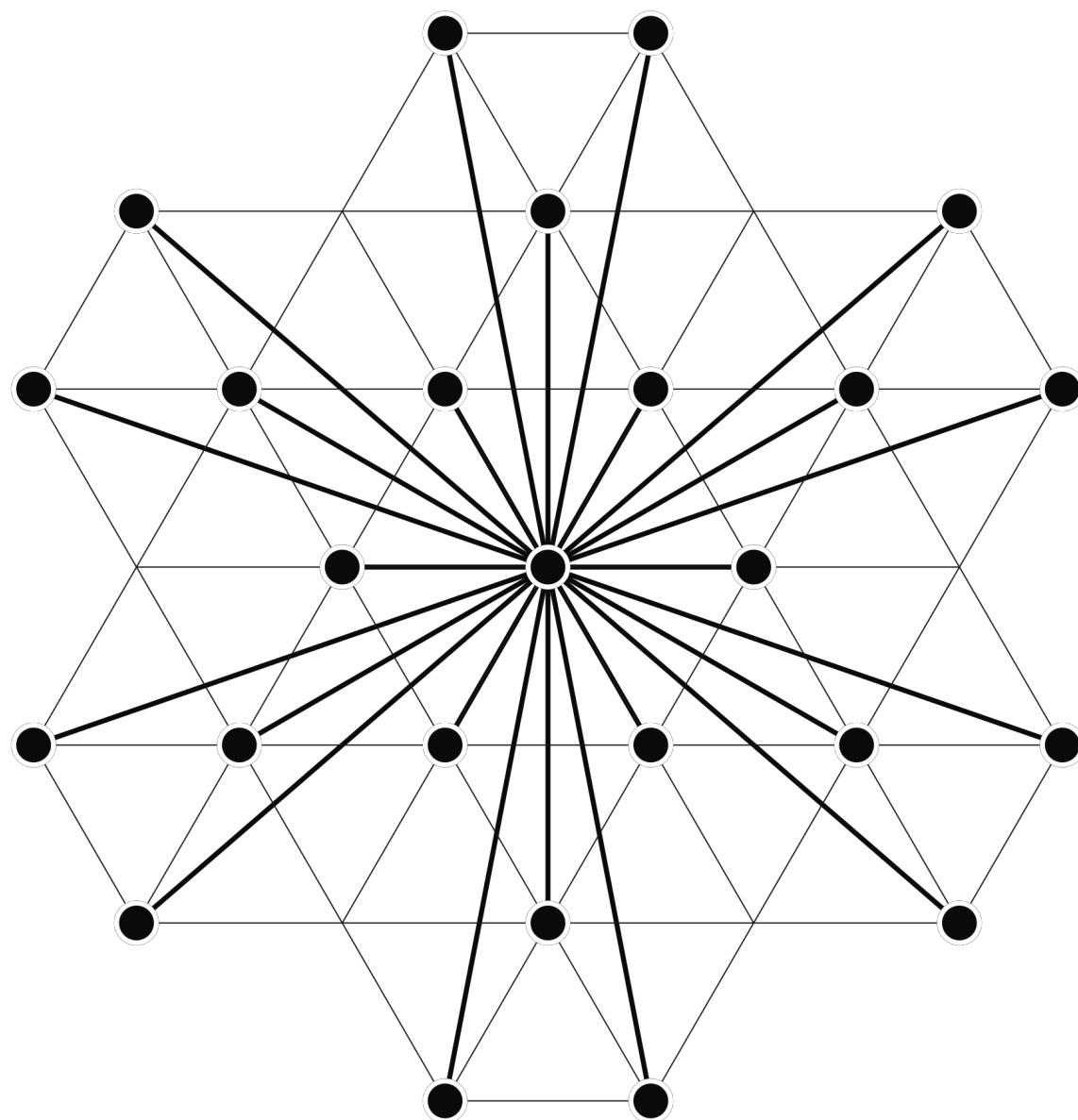




Satellites

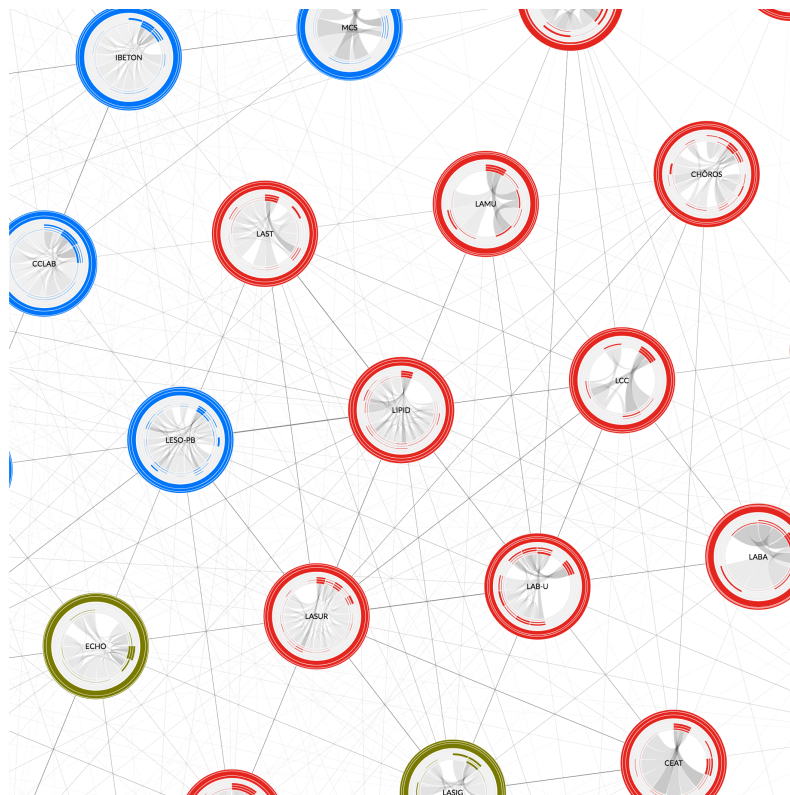
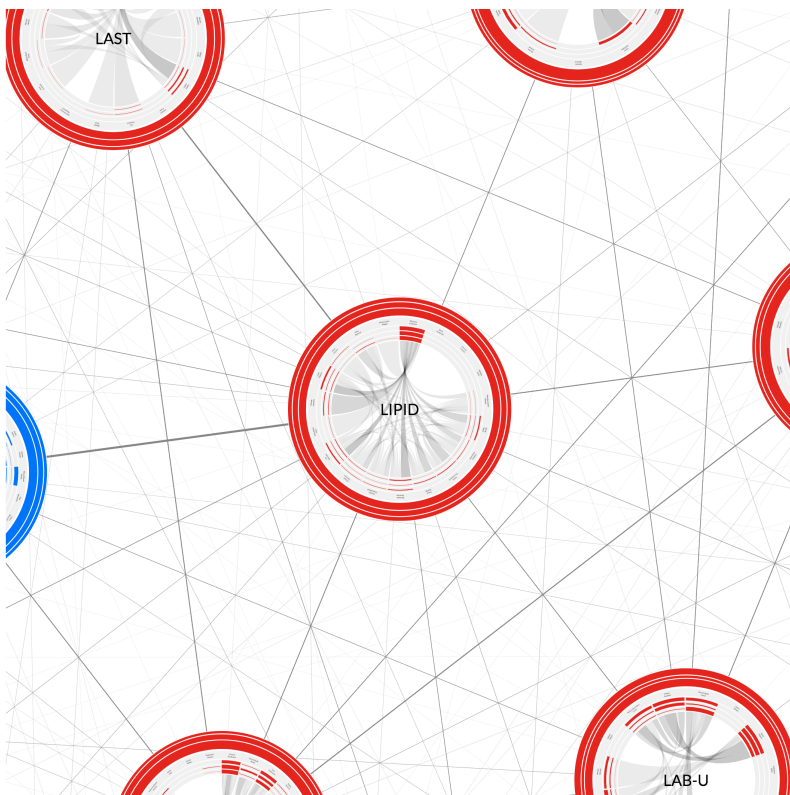
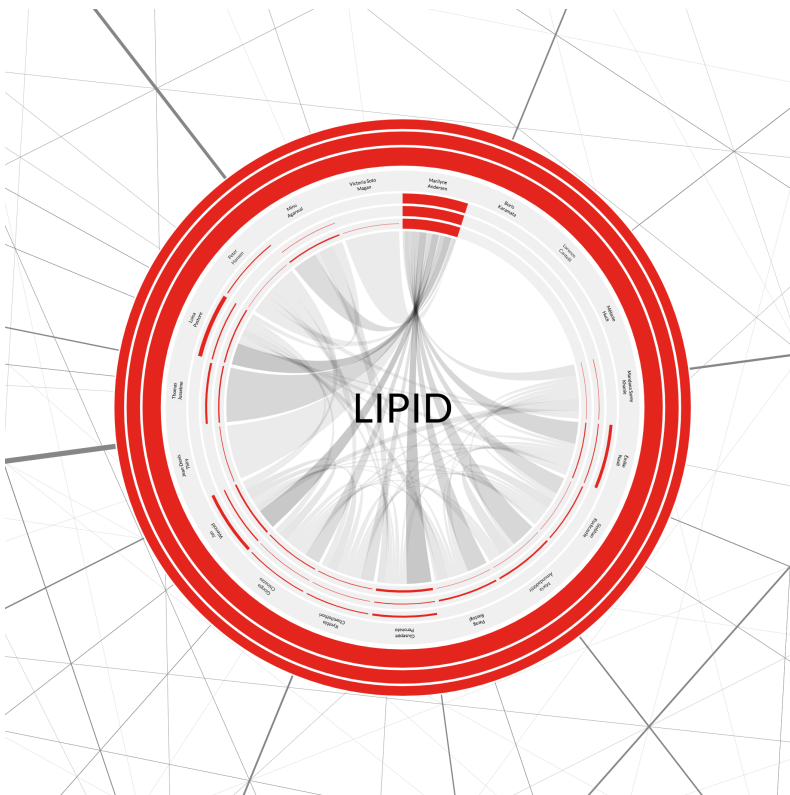
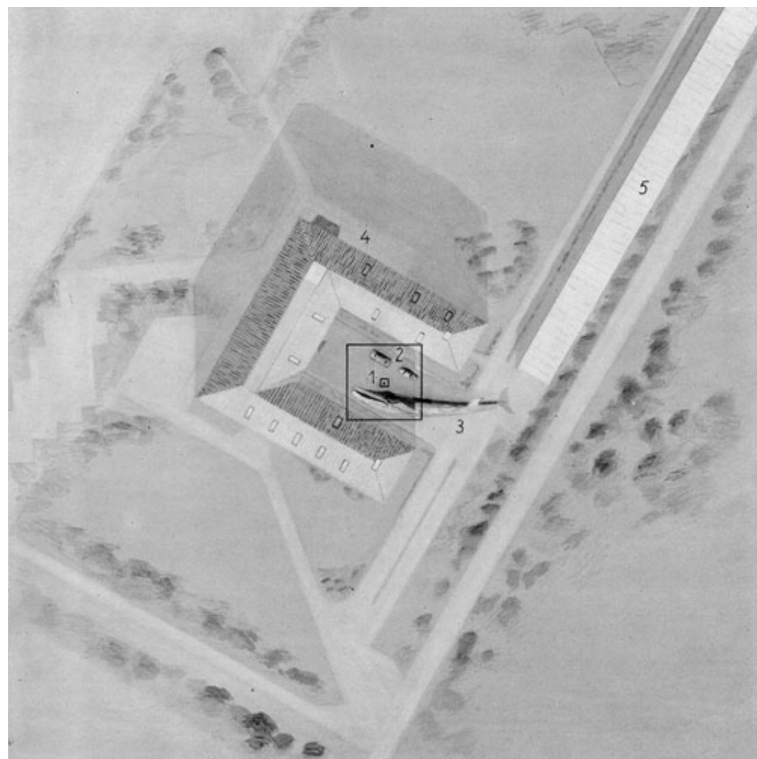
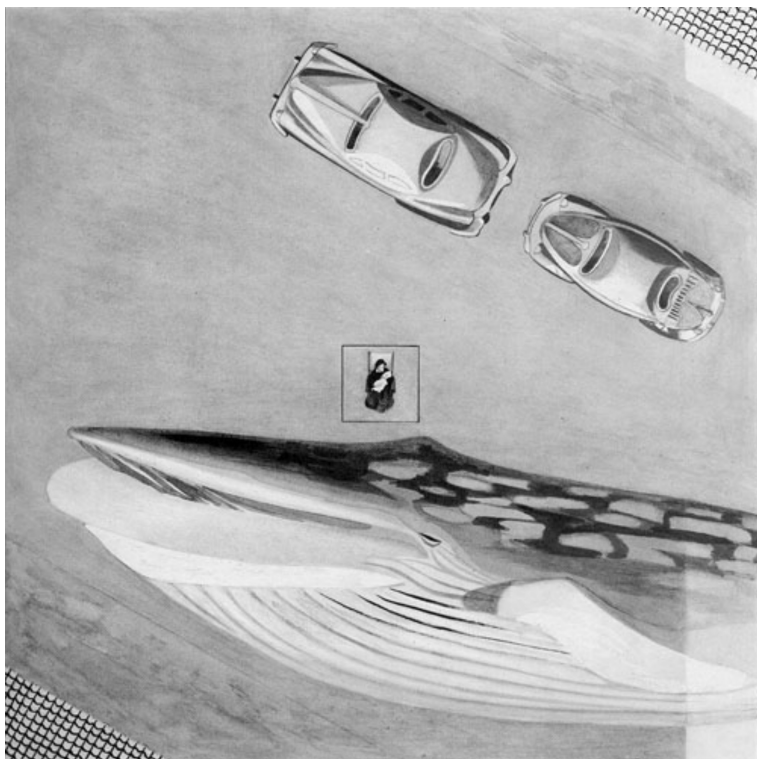
intermediary connectivity level

*“Visual Information-Seeking Mantra: overview first, **zoom**
and filter, then details on demand.”*

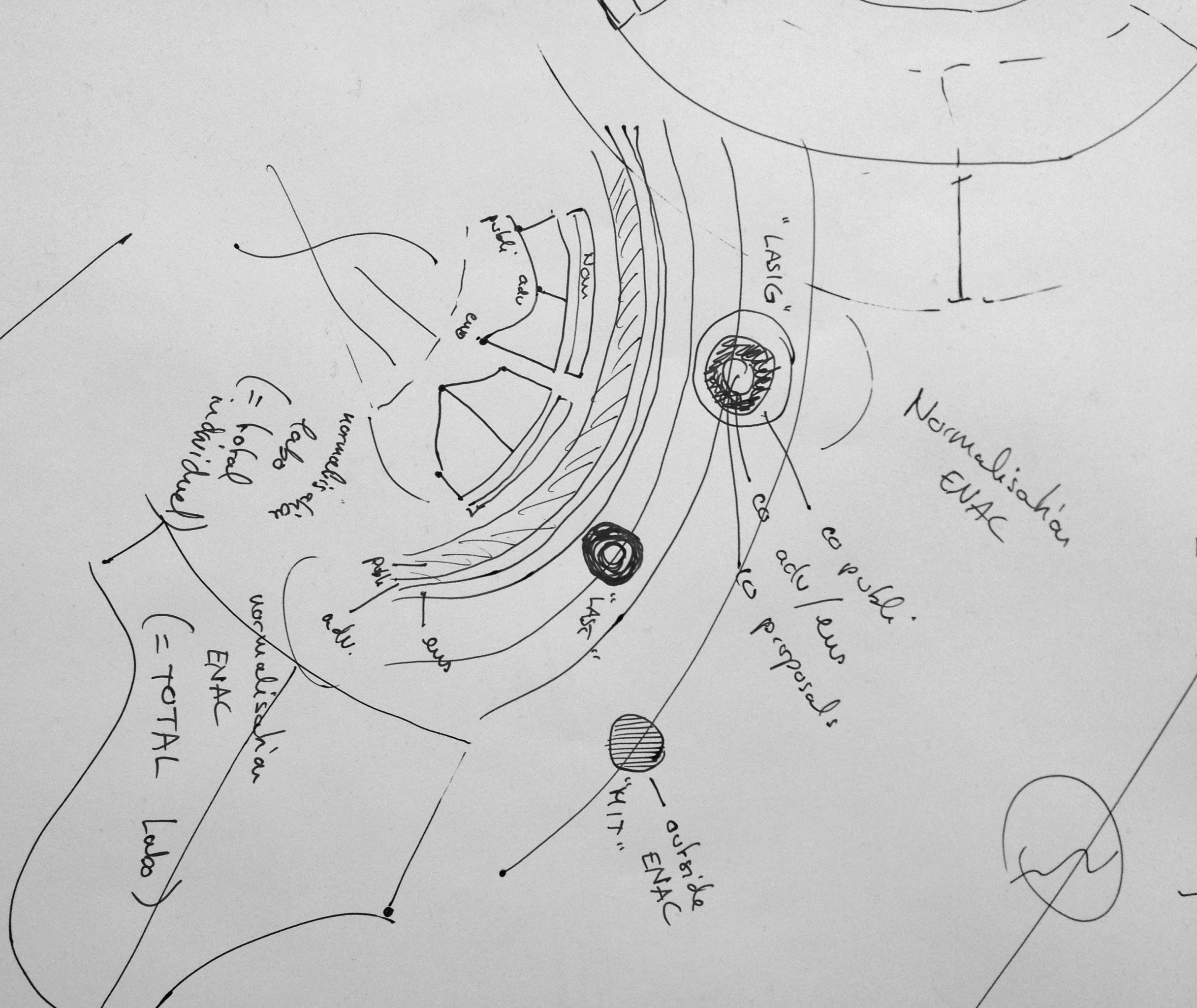


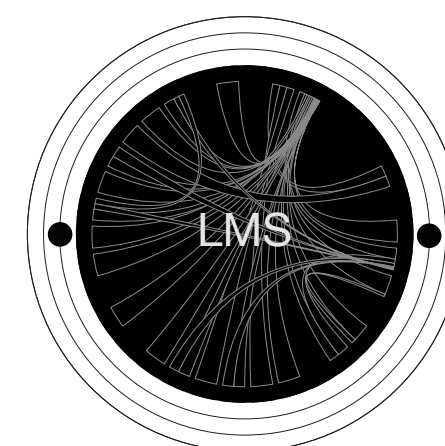
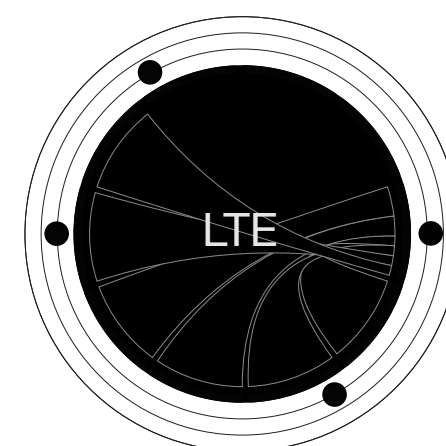
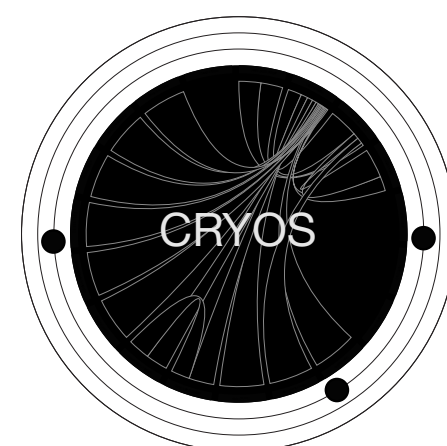
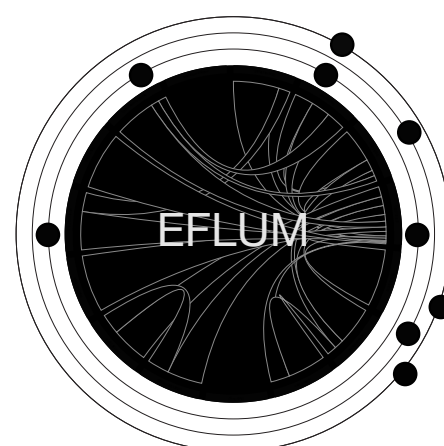
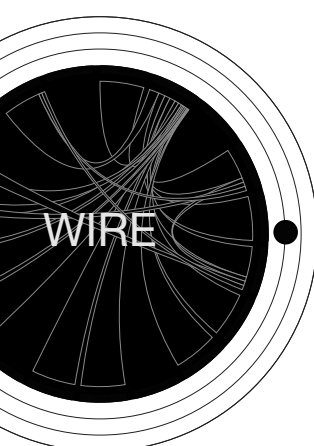
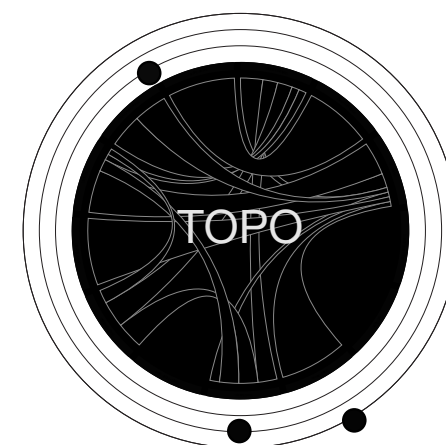
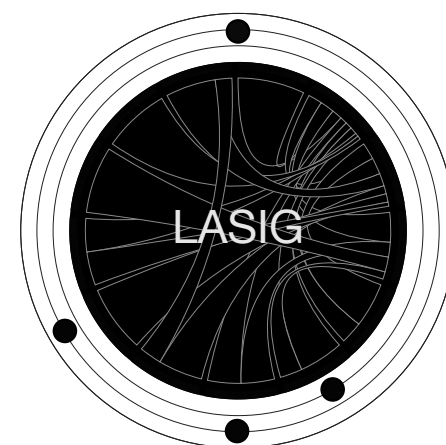
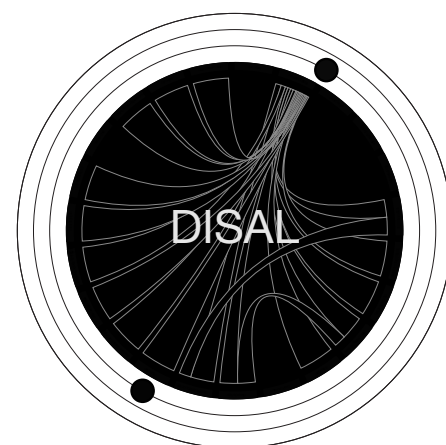
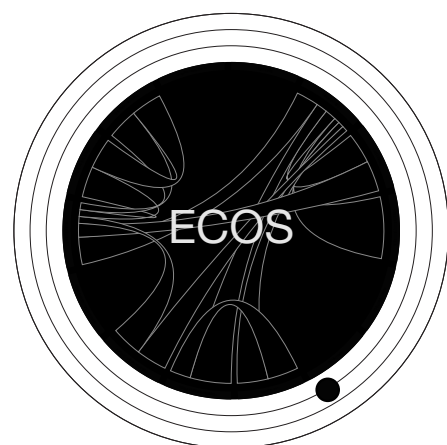
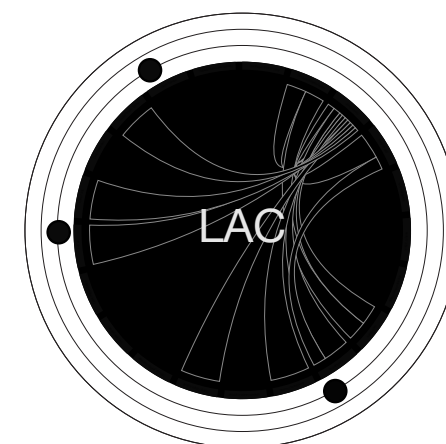
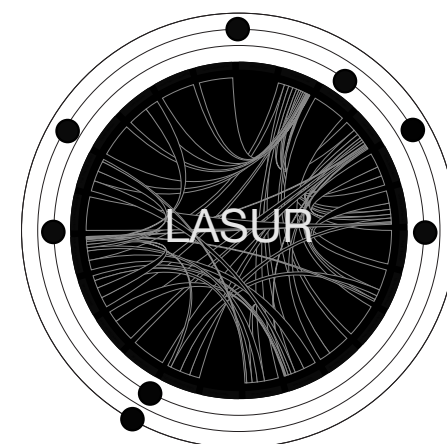
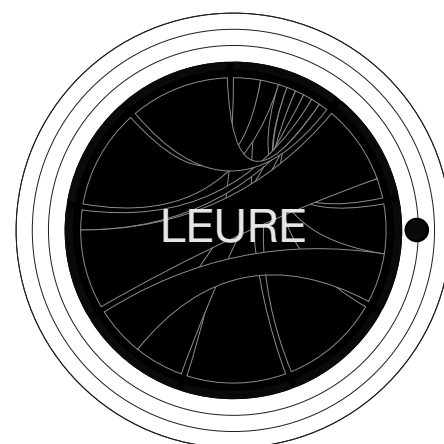
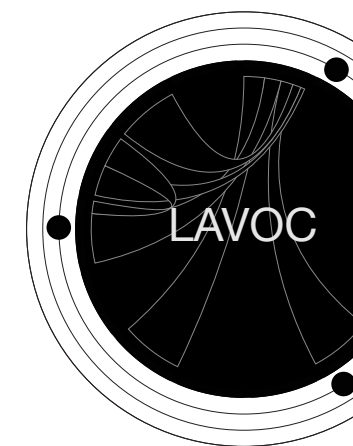
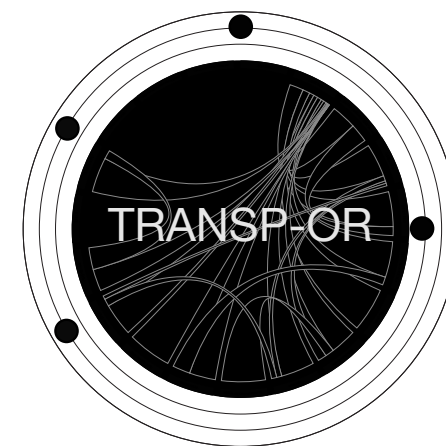
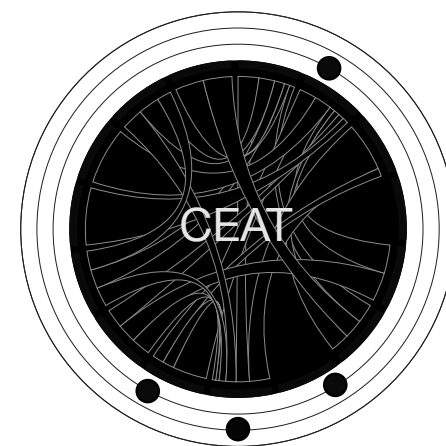
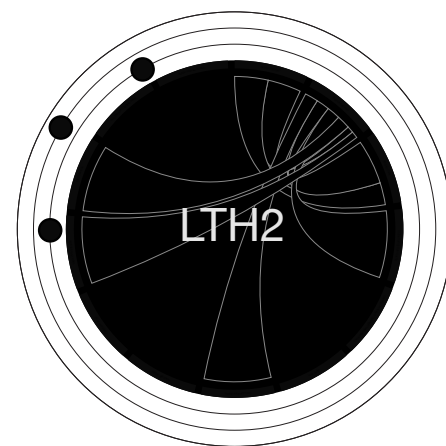
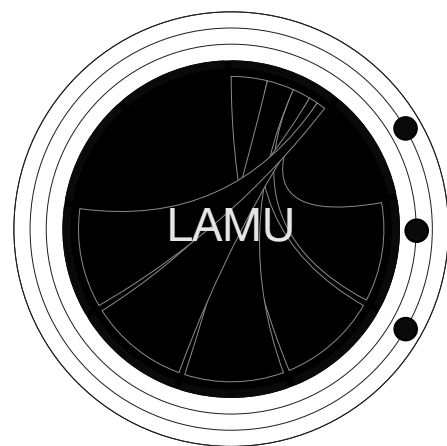
Intermediary level: Meso

*“In this awesome journey to the ends of the universe, you have learned an immense amount **about its structure and the beings and things** that occupy it, and above all **about the relationships of things** to each other, in their various scales of dimension, with a vividness that words cannot express.”*



“Micro and macro [...] are really two faces of the same thing”





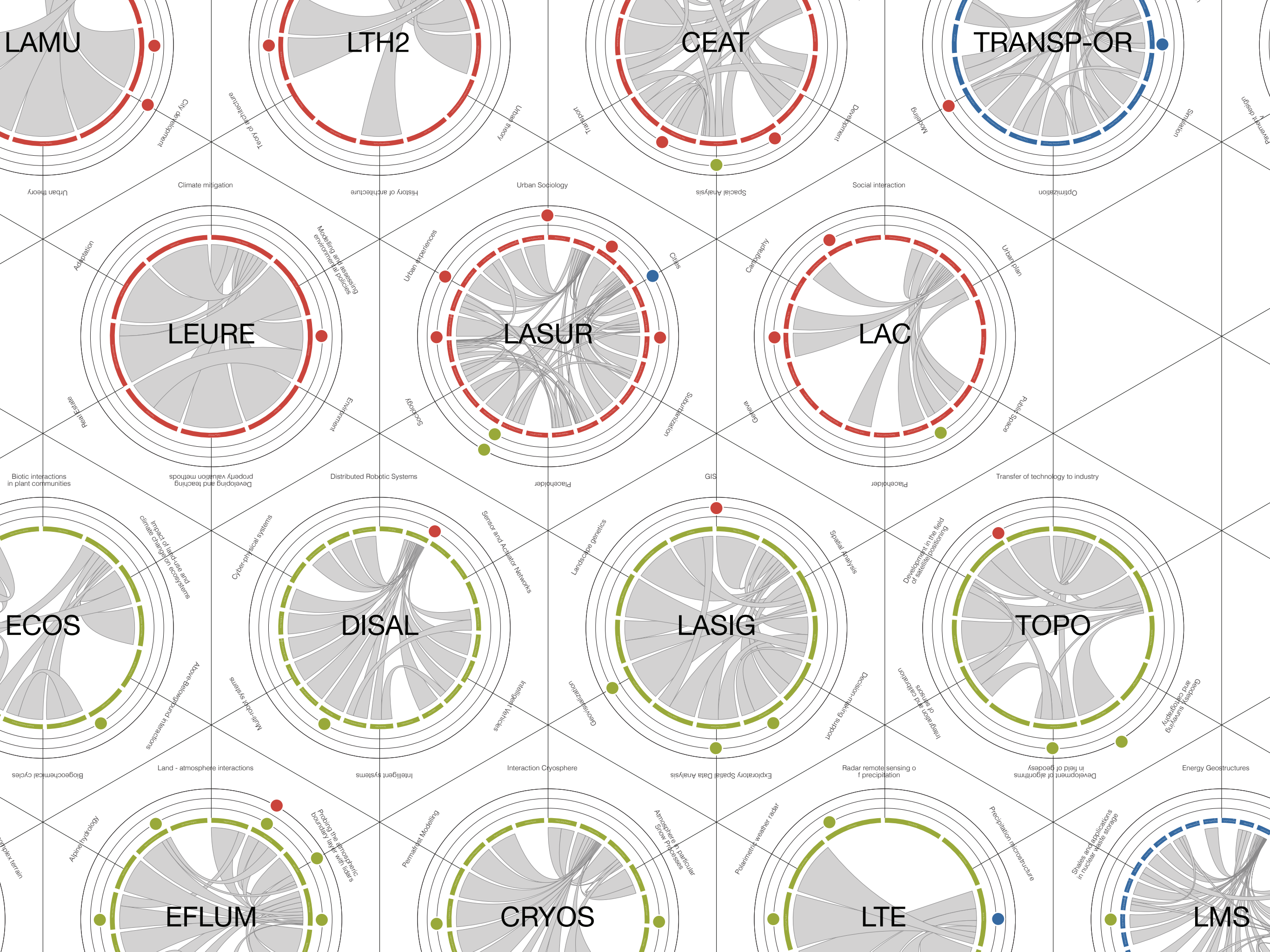
Semantic Background

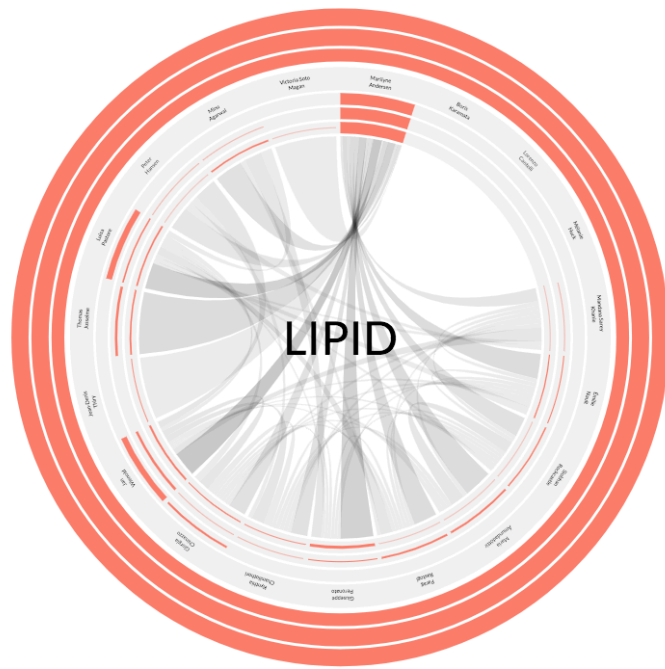
defining potential affinities

“In information retrieval, $tf-idf$ or $TFIDF$, short for term frequency–inverse document frequency, is a numerical statistic that is intended to reflect how important a word is to a document in a collection or corpus.”

— Wikipedia 2018

```
1  [{
2    "id": 53310,
3    "authors": ["Bradley, Joseph", "Loucks, Jeff", "Macaulay, James", "Noronha, Andy", "Wade, Mi
4    "title": "Digital vortex: How digital disruption is redefining industries",
5    "description": "Digital business transformation is a journey to adopt and deploy digital tec
6    "keywords": ["DIGITAL DISRUPTION", "DIGITAL BUSINESS TRANSFORMATION", "DIGITAL VORTEX"],
7    "terms": {
8      "digital": 13.493059996310013,
9      "disruption": 12.672948161851869,
10     "journey": 8.842000017916671,
11     "models": 7.666426688112432,
12     "technologies": 7.558292245571881,
13     "inevitability": 6.030437921392435,
14     "quantifiably": 6.030437921392435,
15     "grasp": 6.030437921392435,
16     "business": 5.884233501463874,
17     "redefining": 5.624972813284271,
18     "overturn": 5.624972813284271,
19     "reshape": 5.624972813284271,
20     "resulting": 5.624972813284271,
21     "step": 5.624972813284271,
22     "deploy": 5.624972813284271,
23     "position": 5.33729074083249,
24     "proposition": 5.33729074083249,
25     "effect": 5.11414718951828,
26     "force": 5.11414718951828
27   }
28 }, {
29   "id": 54016,
```

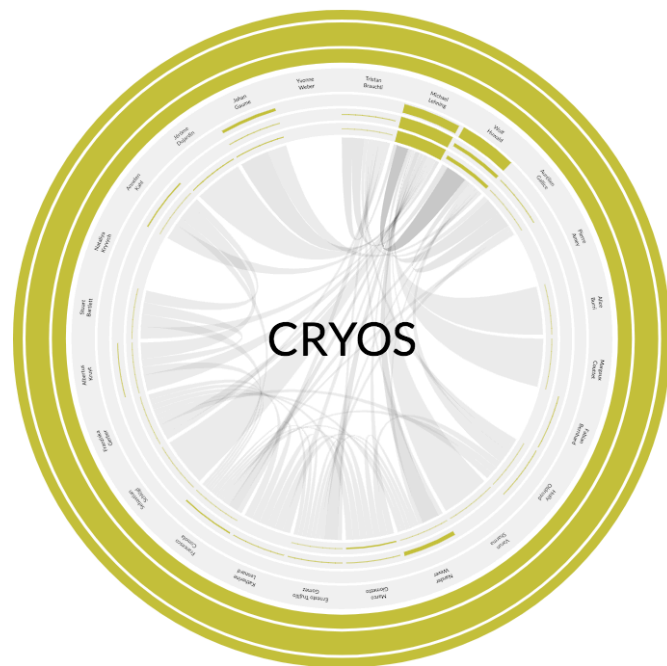


solar
thermal
climate
energy

bipv
solar
energy
buildings
assessment
neighborhood
architectural
irradiation
prototype
workflow
design
urban

Characteristics

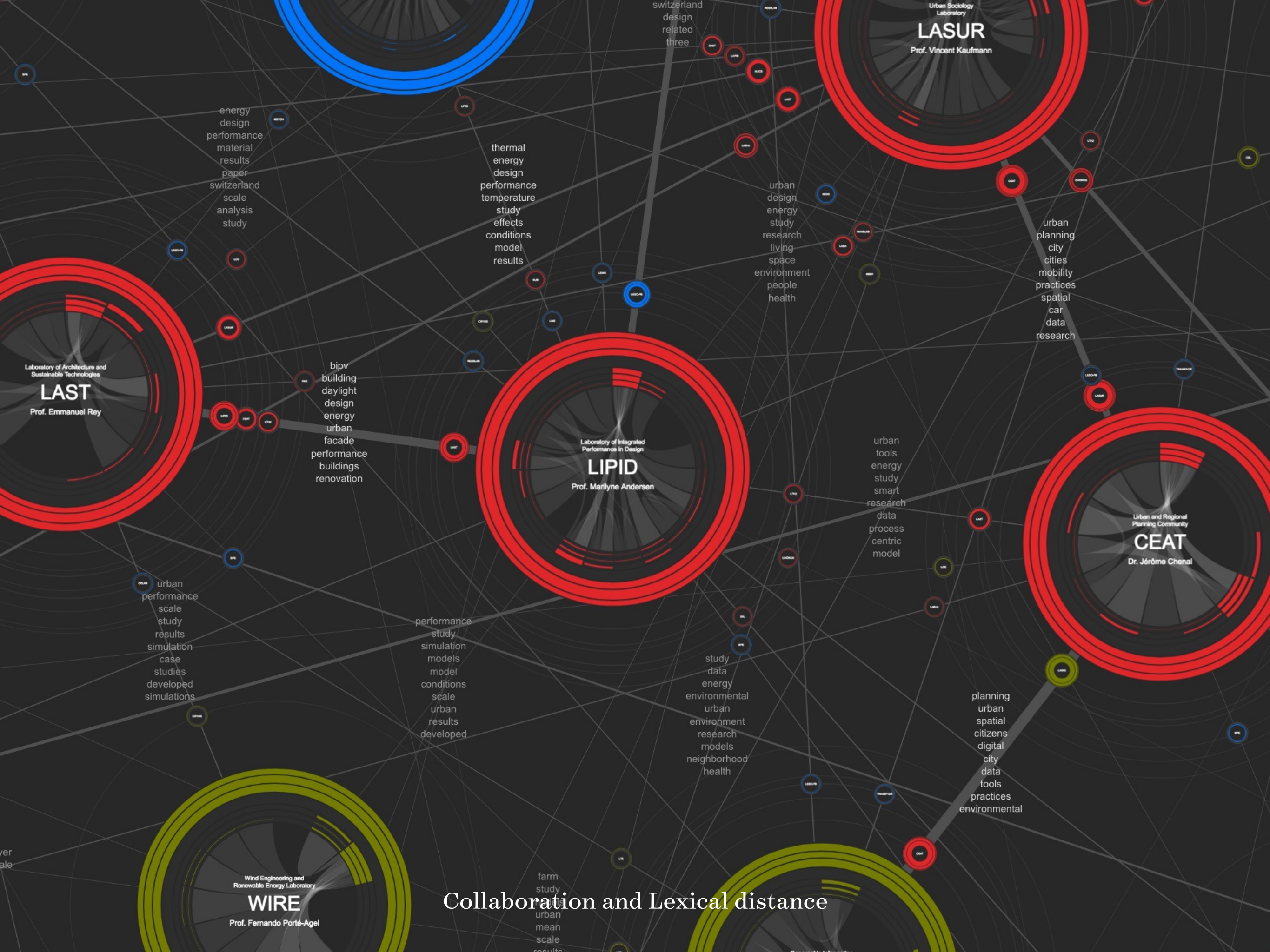
- Use of hexagonal grid
- Justification of closeness
- Semantic layer on links
- Color meaning



solar
energy



Keywords as potential affinities.



Collaboration and Lexical distance

Walkable Visualization











Conclusions

Process of design

Reduction and amplification

Collage

New visual grammars

Readers want to see their one self

Ethics

Threshold of privacy

Assembling individuals

Thanks